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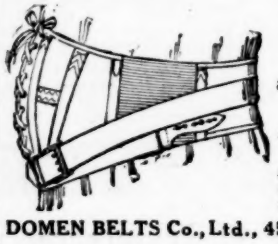

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According to some enthusiasts the evolution of man has been modified by changes which have occurred in certain glands of internal secretion.* The conception of internal secretion has also invaded the realms of the social, ethical, and moral sciences. Even the doctrine of original sin has been abandoned in some quarters for that of endocrine perversion, and the bad behaviour of children and adults has been attributed to disordered function of the ductless glands. It is frequently urged that the secret of health and happiness resides in the adequate and harmonious functioning of the endocrine organs.†

2. HISTORICAL.

The "consensus partium" of the older medical writers was supposed by Cuvier, who died in 1832, to depend on the activity of the nervous system and upon nothing else, although in 1775 Théophile de Borden[1] had promulgated some views which have been supposed to indicate a fairly clear conception of internal secretion. This interpretation has been maintained by Neuburger[2] and by Biedl.[3] But Gley,[4] who quotes in full the passages in question, is of opinion that Borden does not express himself so definitely as Neuburger believes. It is clear, nevertheless, that Borden looks upon each organ as the source of a "humeur particulière" which exerts its influence upon the body generally. Gley,[5] in 1897, called attention to the ideas formulated by Legallois,[6] who, as long ago as 1801, entertained very definite views as to the relationships which exist between the different secretions and the variations in composition of the venous blood. The following is a translation of the text of Legallois:—

"From the identity of the arterial blood and the diversity of the venous bloods, one may conclude . . . . that the triumph of animal chemistry would be to find relations between the arterial blood, the matter of such secretion and the corresponding venous blood, both in health and pathological conditions in different animals; to find the differences between the various venous bloods; and, in short, to find these differences proportional to those of the corresponding secretions.

Arrived at this degree of perfection, it would often be possible that the unknown was revealed by the equation: arterial blood = *such secretion + corresponding venous blood* (the italics are the author's)—that is to say, the first number being given, it would be possible almost to guess at what ought to be the secretion if one knew the venous blood, or what ought to be the nature of the venous blood, if one knew the secretion."

Gley calls attention to the fact that Legallois's observations are general and that they apply to all the glands, and not only to those which ought properly to be called internally secreting glands. But it is only just to add that this criticism applies equally to the writings of several authors within recent years.[7] When we come to the work of J. Müller[8] in 1838 we find merely the statement that the glands without ducts can only exert a certain plastic influence on the fluids which circulate through them. "They consist, therefore, almost wholly of vessels." In 1852 W. B. Carpenter,[9] in Todd's cyclopædia in an article on secretion, writes as follows:—

"There is another group of processes, which corresponds so completely with the secreting operations in its general nature, that it is difficult to avoid placing it under one category with them . . . . We refer to that elaborating agency, which is now generally believed to be exerted upon certain materials of the blood by the spleen, thymus, and thyroid glands, and suprarenal capsules (which are sometimes collectively termed vascular glands) . . . . The 'vascular glands' . . . . exactly correspond with ordinary glands in all that part of their structure by which they withdraw or eliminate certain matters from the blood; and they differ only in being unprovided with excretory ducts for the discharge of the products of their operation. These products, instead of being carried out of the body, are destined to be restored to the circulating current apparently in a state of more complete adaptiveness to the wants of the nutritive function."

But Carpenter thinks that fatty tissue has a similar function. It will readily be conceded that the conception of internal secretion entertained by Carpenter is, at any rate, not very different from that which would have been accepted by many physiologists only a few years ago. It only differs from the more modern view in including the spleen and adipose tissue among the ductless glands. We are thus able to realise that so far back as 1852 the principal idea in the theory of internal secretion was present in the minds of some writers, only the term "internal secretion" was not commonly used. The anatomists of the period would appear to have been largely responsible for the initiation of the conception, for having decided that certain structures without ducts were nevertheless in their essence glands, they had no hesitation in postulating the flow of secreted material into the blood-stream. Caspar Friedrich Wolff (1733–1794) has been credited with the statement that "each single part of the body, in respect of its nutrition, stands to the whole body in the relation of an excreting organ."[10] A renewed investigation of the literature reveals a passage by Treviranus to the effect that "Each single part of the body, in respect of its nutrition, stands to the whole body in the relation of an excreted *substance*." (The italics are the author's.)[11] This passage from Treviranus is, of course, of very different import from that attributed to Wolff.[12]

The first experimental demonstration of internal secretion was, undoubtedly, that of Berthold, of Göttingen, in 1849.[13] This writer describes the removal of the testes from young cockerels and their transplantation to the surface of the intestine. He found that when this was done the young cockerels did not develop in the way that castrated animals usually did, but that they grew into normal cocks. Berthold concluded that the "consensus partium" depends on the fact that the testes affect the blood and the blood affects the whole organism.‡ He was, however, of opinion that the nervous system plays a part in the sequence of events. These observations of Berthold appear to have been entirely overlooked until they were unearthed by Biedl.[14]

The Modern Doctrine of Internal Secretions.

But the doctrine of internal secretion as it is generally taught to-day was founded by Claude Bernard and Brown-Séquard. There is no need to quote passages from these authors in support of their

* See also Hormones and Heredity, by J. T. Cunningham, London, 1921.

† See The Glands Regulating Personality, by L. Berman. The Macmillan Co., 1921. (THE LANCET, 1922, i., 741.) An entertaining review by J. C. Squire will be found in the Observer, Feb. 26th, 1922.

‡ ". . . . der fragliche Consensus durch das productive Verhältniss der Hoden, d.h., durch die Einwirkung auf das Blut, und dann durch entsprechende Einwirkung des Blutes auf den allgemeinen Organismus überhaupt, wovon allerdings das Nervensystem einen sehr wesentlichen Theil ausmacht, bedingt wird."

claims. Bernard stated in the clearest terms that certain organs, such as the spleen, the thyroid body, the suprarenal capsules, and the lymphatic glands, furnish an internal secretion.[18] His statements did not at the time attract much attention; but Brown-Séquard's work on the stimulating effects of testicular extracts aroused an almost universal interest in the subject. Brown-Séquard extended the meaning of the term "internal secretion" far beyond the limits imposed by Bernard; he believed that all the tissues of the body furnish an internal secretion and take part in the humoral functional correlation of that body.[16]

Among the recent discoveries which have supported and developed the doctrine of internal secretion may be specially mentioned the following: the association of myxœdema with disease of the thyroid, and the value of treatment by thyroid substance; the association of acromegaly with disease of the pituitary body; the glycosuria produced by extirpation of the pancreas; the pharmaco-dynamical effects of extracts made from the chromaphil tissues and from the pituitary body; and the isolation of adrenin and thyroxin. The main conception of internal secretion has not been advanced, and has been only slightly modified since the time of W. B. Carpenter (1852),[9] but a tangle of outré theories and crude practices has grown around the original simple conception.

3. NOMENCLATURE.

We may, perhaps, learn something from a survey of the nomenclature of internal secretion. Such a survey is desirable, not only because the words used or coined for purposes of special designation crystallise to a certain extent the current views, but also because words once set apart or manufactured thereafter play a large part in helping to develop or stereotype the ideas of both teachers and learners. The evil influences of words and names when they are permitted to "twine themselves round the understanding" were recognised by the illustrious author of the Novum Organum, and were attacked by him under the designation of *idola fori*—idols of the market.

We have seen already how the idea of internal secretion arose and became current in the literature of physiology and the medical sciences. In 1905, however, Starling introduced the term "hormone" (ὁρμάω, to arouse or excite). The word was universally adopted and used as synonymous with "internal secretion," though it is frequently defined as meaning a "chemical messenger." Philologically, of course, the word implies neither a chemical nature nor a messenger's duties. As pointed out by Schafer, the expression "hermone" (Ἑρμῆς; Mercury) might better have conveyed the idea of a messenger. In 1911 Gley[18] advocated the use of the term *harmozone* (from ἁρμόζω, to regulate) to apply to substances which regulate chemical processes and functions. The harmozones were further divided by him into three groups of substances: (1) helping in nutritive exchanges; (2) serving to maintain the composition of the blood and lymph; and (3) having a morphogenetic function. According to Gley, Starling's term "hormone" should be retained for specific functional excitants. Gley has also recommended for adoption another word—"parhormone," to be used for such substances as CO_2, which he considers not to be true hormones but waste products having an accessory excitatory rôle.§

Inhibitory Substances.

But it became recognised that the internal secretions do not all act as excitants. Some of them contain substances which have an inhibitory effect. This consideration led Schafer[19] in 1915 to suggest two new terms. The word "hormone," he points out, should be restricted to excitant secretions, for those with inhibitory or relaxing actions he would use the word "chalone" (χαλάω, to make slack or relax).

For an expression to include both hormones and chalones Schafer advises the term "autacoid substance" (ἄκος, a remedy, and αὐτός) to denote any drug-like principle produced in or extracted from the internally secreting organs. So that we have, according to Schafer, the *autacoid substances*, divided into two groups, *hormones* or excitants, and *chalones*, or depressants.

Other expressions have recently crept into the literature. The word *endocrine* is now commonly used as an adjective applied to the internally secreting organs, their functions, and their products. "*Endocrinous*" appears to be preferred by some writers, while *endocrinology* is the term applied to the subject of internal secretion, an *endocrinologist* is either a worker on the subject or a practitioner who treats diseases arising from disordered internal secretions. Transatlantic usage has made "endocrine" into a substantive. Matthews[20] has made use of the expression "*cryptorhetic*" (κρυπτος, hidden, and ῥεω to flow) as a descriptive designation of the internal secretions. This term, like "endocrine" (κρίνω, to separate) has the advantage of being non-committal in respect of any theory as to the way in which the substance acts. But neither word conveys any further meaning than is implied by the old term "internal secretion." Noel Paton's[21] view of the mode of action of internal secretions, if accepted, would render many of the terms in general use unsuitable. He regards the substances contained in these secretions as playing a part similar to that played by the salts of the blood in maintaining the efficiency of the heart's action. "A certain minimum amount of each seems to be essential, and some proportion between the amounts of each must be maintained if the metabolism is to continue in its normal course . . . . It seems to me that such a conception is more in accordance with the facts which we possess than that of a series of hormones or excitors calling forth the activity of the various tissues." It must be conceded that this conception fits in admirably with what we know of the part played by thyroxin in relation to the metabolism of the body. A view closely approximating to, if not quite identical with this, is held by Kendall, who regards thyroxin as a catalytic agent. No new term has, so far, been invented to express these newer views, and we shall be fortunate if the word-coining activities should cease for a time. The term "internal secretions" is sufficiently definite to indicate for ordinary usage what little we know about these bodies.

4. METHODS OF INVESTIGATION AND VALUE OF RESULTS.

In the investigation of a subject having such extensive ramifications it is to be expected that all the various methods employed in physiological research should be utilised as occasion demands. It is not my present purpose to make any attempt to review all these methods, but that of intravenous injection of tissue extracts holds a peculiar position and requires some discussion. This method only came into prominence in 1894, after the publication by Oliver and Schafer of their discovery of the extraordinary pharmaco-dynamical effects produced by extracts made from the chromaphil tissue contained in the interior of the adrenal body. Since that time numerous observers have investigated the effects of extracts made from every organ and tissue in the body, but the hope of discovering some remarkable activity which might rank in importance with that of adrenin has not been fulfilled. So far as the chief physiological activities of animal extracts are concerned (the effects upon heart, blood-vessels, and certain other tissues) the main points of interest were fully established by Oliver and Schafer. One other tissue besides the chromaphil—namely, the nervous portion of the pituitary body—contains a *pressor* substance. As for extracts made from other organs and tissues, the generalisation slowly became established in the minds of the majority of observers that tissues ordinarily impart to extracts a substance or substances, the most striking action of which, when tested physiologically, is a *lowering* of the blood pressure. There are, of course, other effects also, as, for example, that on the pupil.[22]

§ Starling included CO_2 among the hormones.

Notwithstanding that investigators were given frequent warning that these results are pharmacodynamical only, and bear no necessary relation to any hypothetical internal secretion by the tissues explored, communications continued to be poured out which either concluded definitely, or implied strongly, that such pharmaco-dynamical results are in themselves evidences of internal secretion. It was clear to the more sophisticated workers that in most, at any rate, of these tissues there is no reason to regard the presence of such active substances as evidence that the tissues in question furnish an internal secretion. It would, for example, be preposterous to assert that the presence of depressor substances in brain extracts has any direct bearing upon the problems of brain physiology; and no one up to the present time has ventured to suggest that the depressor action of brain extracts points to an internally secreting function of the higher nerve centres. This line of investigation has been pursued with a minimum of critical judgment. Thus Livon[23] divides the glands of the body into two groups, "hypertensive" and "hypotensive," according as their extracts cause a rise or a fall of blood pressure when injected into the veins of an animal. If we are condemned to make such a classification, it follows that we have to place the chromaphil tissues and the nervous portion of the pituitary body in the first group, and all the other organs and tissues of the body in the second. Gautrelet[24] holds very similar views, and thinks that the "hypotensive" glands owe their activity to the presence of cholin. The point of view of these two observers is typical of those who maintain that all organs and tissues of the body furnish an internal secretion, and that the normal blood pressure and other standard conditions are maintained by a series of antagonistic chemical agencies arriving from different glands and tissues. This view has been derived from theories of the activity of adrenin in the animal body—theories vitiated by a fundamental error of thought, which was prompted by the belief that the study of the physiological effects of extracts of organs and tissues would solve the problems of internal secretion. It is still necessary to point out that whilst the physiological activity of an extract of an organ or tissue may be the basis of an inference as to internal secretion, the inference cannot become proof until we can show that the active substance is secreted into the blood-stream, and, having arrived there, performs some function in the economy. That it is still necessary to point out these things is shown by a recent communication of Marfori,[25] in which is contained a careful account of the physiological action of lymphatic glands. This action is the same as that obtained by extracts of brain, spleen, or any other organ or tissue (except chromaphil and posterior pituitary), yet the author, solely on the basis of such action, announces a new hormone, "lymphoganglin."

Gley has attacked the uncritical use of the method of organic extracts, and points out that the attitude we have been discussing is very definite and deliberate in the case of some authors. He quotes Marañon to the effect that one may "consider each extract of an organ as equivalent to the total internal secretion of the gland," and records his astonishment at such views. J. Camus and G. Roussy[26] have expressed themselves concerning pituitary extracts as follows: "It is true that these extracts produce a contraction of the uterus. Seeing, however, that the effect is procurable by extracts obtained from bulls and steers, to deduce from the action of the extract the part played by the normal gland in the living bull or steer, is a somewhat embarrassing problem."

To conclude our observations on this part of the subject, it may be admitted that there is no objection to the investigation of the activities of tissue extracts, so long as the investigator realises that the results are in themselves only of pharmacological interest. It is only when several other lines of research have been explored that we may draw conclusions about an internal secretion.

5. Definition and Limitation of the Term "Internal Secretion."

There has been much loose writing and loose thinking on the whole subject of internal secretion. The lack of precise knowledge has tempted writers to conduct crude inquiries, and to promulgate theories, worthless in themselves, which have occupied much valuable space in the literature.

A great deal would be gained if investigators could be induced to agree that the act of secretion can only be carried out by certain kinds of tissue—namely those which consist of highly specialised epithelial cells. We have seen that many writers, in view of the fact that different organs and tissues have different functions, and consequently, pour out into the blood-stream different chemical substances, have taught that all these tissues are to be regarded as having an internal secretion, and that this secretion is in each case a specific one. But this, as pointed out by Kohn, and as I have already urged on several occasions, is simply a misuse of the term "secretion." I cannot find better words to express my views on this matter than those I have employed in my monograph on internal secretion.[27]

"Just as we have certain tissues—namely, muscle and nerve—highly specialised and set apart for the functions of motility, and the conduction of irritability, so we have certain other tissues also highly differentiated and set apart for the purposes of secretion, and it is to these only that we can with propriety ascribe the functions. Such are secretory cells and their accumulations called 'glands.' The secretory cells are in their origin and in their character *epithelial. Secretory cells are highly specialised epithelial cells.* It is not necessary to insist on the criterion in the case of externally secreting glands, because here it is generally recognised, but it is just as important in regard to internal secretion, if the term is to be defined with anything approaching to accuracy. The morphological sign of special differentiation in gland cells is the presence of granules which undergo periodical changes in number and position according to the stage of activity of the gland. It is not, perhaps, possible to insist on the recognition of granules as definite as those in the pancreatic cells before we admit a structure into the category of internally secreting glands, but it is essential that the constituent cells should have the general character of glandular—i.e., secretory—cells. This is in some instances not altogether an easy matter to determine, and . . . . there is still some discussion as to whether such a tissue as the chromaphil may reasonably be supposed to have a secretory function. That a discussion of this kind should arise in connexion with a tissue generally supposed to be internally secretory shows how little we know about the actual act of secretion in such a case.

"We conclude, then, that secretion (internal or external) represents a highly specialised grade of metabolic activity and should be distinguished as rigorously from general metabolism as the contraction of muscle from general motility (Kohn).

". . . . We are now in a position to define internal secretion. *The process consists in the preparation and setting free of certain substances of physiological utility (the raw materials for which are supplied by the circulating blood) by certain cells of a glandular type; the substances set free are not passed out on to a free surface but into the blood-stream.*

According to this definition, the products of ordinary metabolism, and even special products of metabolism arising in such kinds of highly specialised tissues as muscle and nerve are excluded from the internal secretions."

It is still desirable to point out that the term "internal secretion" has been used too generally and too confidently. Our knowledge of internal secretion is not yet even remotely comparable in accuracy and definiteness with our knowledge of "external" or ordinary glandular secretion.

6. Some Particular Problems.

It will be advisable to discuss some particular phases of the problem of internal secretion.

(*a*) *Adrenal Bodies.*

If we turn to the subject of the physiology of the adrenal bodies we find ourselves in a veritable quagmire of doubt and difficulty. Of the adrenal body itself (what is usually called the cortex) we know practically nothing. It is only necessary to say that it appears to be essential to life, and to be related in some way to the sexual functions. But it is the mass

of chromaphil cells, which constitutes what is generally called the "medulla" of the gland, that has aroused a phenomenal interest, owing to the discovery by Oliver and Schafer that the tissue contains a substance having very remarkable pharmacodynamical properties. So much stress has been laid upon the possible significance of this observation that in the minds of many physicians and other investigators the problem of the function of the adrenal bodies is synonymous with that of the substance adrenin found in the chromaphil cells contained in the adrenal body.‖

Even from this restricted standpoint, difficulties surround the question not of the function of the adrenal bodies but of the function of the chromaphil cells within them. There can now be no doubt that the adrenin found in the medulla of the gland is passed out in certain small doses into the general circulation, and that the output is dependent on the nervous system, and can be modified by the action of certain drugs. Otherwise the amount of adrenin eliminated from the gland is fairly constant. According to Stewart[28] suppression of the adrenin output either by extirpation of one adrenal and denervation of the other, or by removal of one and a large proportion of the other gland and denervation of the remaining fragment, does not affect the life or health of animals. It would take too long to enter into all the arguments on this matter, but we may say that there is little or no evidence that the medulla of the adrenal bodies is of any importance in the normal economy of the animal. Again, notwithstanding the views of Cannon and their wide acceptance among physicians, it is very doubtful whether the adrenin output is at all affected by emotional excitement.

It is true that the dependence of the adrenin output upon the nervous system, and its relative constancy, suggest that the substance has an important function in the economy, but, as Stewart very reasonably urges, the hypothesis that adrenin is toxic and that the output must be kept down is equally consistent with the known facts. Stewart suggests that adrenin may be a survival from a stage of development in which chemical stimulation of various activities was relatively more important in proportion to the nervous. Notwithstanding all this the standard text-books still teach that the chromaphil tissues have "the function of maintaining the normal constriction of the arterioles and of facilitating in some way or other the function of the sympathetic system generally." It is alleged that "the absence of this secretion in cases of destruction by disease of the suprarenals would serve to account for the weakness, prostration, and lowered blood pressure of Addison's disease."[29] Now it has been pointed out again and again that so far as physiological experiment can teach us, such amounts of adrenin as are normally poured out into the blood-stream would tend to lower the blood pressure and not to raise it. The earlier experimenters on the subject failed to note this, because the depressor effects of small doses of adrenin are not observed under deep anæsthesia.[30] Experiments carried out under my direction showed that tying-off the blood from the adrenal bodies does not materially affect the blood pressure.[31] The so-called "tonic" theory of adrenal function is the one generally held by clinicians, despite the fact that the experimental work fails to demonstrate any definite physiological value for the adrenin output.

Hoskins[32] has recently referred to a *rapprochement* between those who accept and those who doubt the "emergency theory" of adrenal function, but the matter is by no means settled. One of the most contentious points at issue between Cannon, on the one hand, and Stewart and Rogoff on the other, is whether or not acceleration of a denervated heart following emotional or sensory excitation is valid evidence of the discharge of adrenin. The latest experiments of Cannon appear to confirm the view that the acceleration can only be accounted for by the discharge of adrenin. Elliott found that when the splanchnic nerve is stimulated the blood-pressure curve rises rapidly for a time, then is cut down nearly to the original level, whence it rises slowly and remains high as long as the stimulation is continued. I have found that this is the normal effect in the dog as well as in the cat, and occurs when both vagi are cut. According to Elliott the "dip" of the splanchnic curve does not occur if the adrenal bodies are tied off, but Gley and Quinquaud, on the other hand, believe that the adrenal bodies have nothing to do with the result and that the shape of the splanchnic curve is totally unaffected by the presence or the absence of these glands. My own experiments[33] have persuaded me that part of the dip is clearly due to adrenin poured out into the circulation while part is due to some other cause unconnected with the adrenal bodies. Possibly the small dip which sometimes persists after the adrenal circulation has been tied off is due to adrenin derived from the abdominal chromaphil body and from other masses of chromaphil cells. It is almost impossible to determine this point by direct experiment. Anrep[34] believes that the constriction of a denervated limb which occurs during the pressor response to stimulation of the central end of an afferent nerve is due to the action of adrenin. He was led to this conclusion by the observation that after removal of the adrenal bodies from the circulation the limb does not become constricted, but follows passively the blood pressure.

The results obtained by Pearlman and myself confirmed this view. We found that suppression of adrenal function does not seem to affect the degree of alteration in blood pressure brought about by vasomotor reflexes. It is probable, however, that even when the limb is intact, the chromaphil tissue of the adrenal body must affect the distribution of blood, when a stimulus is applied to an afferent nerve. It can scarcely be supposed that the presence of an intact nerve-supply can totally mask the action of the chemical agent. At the same time it is difficult to be certain that the chromaphil tissues affect vasomotor reactions in the ordinary circumstances of life. Moreover, it is not known what follows after adrenal suppression when a weak stimulus causes a depressor response. Hoskins, Gunning, and Berry[35] found that with nerves intact adrenin causes active vaso-dilatation of the muscles, and vaso-constriction in the cutaneous vessels, so that while the entire limb usually constricts a skinned limb will invariably dilate. Pearlman and I confirmed this result. As further shown by Gruber[36] the results just described are only obtained when the nerves to the limbs are intact. In the denervated limb, adrenin does not cause vaso-dilatation in the muscles. These results agree with what was found by Pearlman and myself—namely, that when the splanchnic nerve is stimulated peripherally, or the sciatic centrally, in such a way as to give pressor responses, the intact limb follows passively the blood pressure while the denervated limb constricts. This follows from the fact that in the denervated limb the vessels of the muscles do not actively dilate and therefore fail to produce the masking or swamping effect upon the skin constricture. This explains why the presence of intact nerves interferes with the response to the chemical agent.

With regard to the effects of asphyxia upon blood pressure and the alleged part played by the adrenals, my own results agree with those of Gley and Quinquaud, and differ from those of Anrep. I have never been able to obtain tracings showing any appreciable difference in the behaviour of a denervated limb during asphyxia in an animal with adrenal bodies tied off, as compared with that in a normal animal. There can, then, be little doubt that when powerful artificial impulses are transmitted along certain afferent or efferent paths, the chromaphil tissue of the adrenal bodies plays a part in the total response. Whether under normal conditions of the animal, the natural gentler impulses which may be so transmitted are sufficiently powerful to give results like those in the laboratory, or whether they are of such

‖ It is, I imagine, scarcely necessary to call attention to the widespread occurrence of chromaphil tissue *outside* the adrenal body.

a character as to be adequate for such results, we cannot pretend to say. It is tempting to assume that the impulses do not play any important part under ordinary circumstances, but that they may contribute to the needs of the economy in certain physiological emergencies.

Cramer [37] believes that the thyroid and adrenal bodies act in conjunction with one another, and together form by means of their internal secretions, an apparatus for the heat regulation of the body. He finds histological changes in the chromaphil tissue of the adrenal body after exposure to cold and under various other conditions.

Views of the Viennese School.

The views of the Vienna school as expressed by Eppinger, Falta, Rudinger, and Hess are well known, but in some of their latest forms are too complicated for any straightforward statement or indeed for clear understanding. The word "vagotonia" is used in a kind of clinical antithesis to "sympathicotonia," and the physician is expected to diagnose and treat these conditions. Just as adrenin is supposed to be the hormone which superintends the work of the sympathetic, so an imaginary "hormone *x*," or "autonomin," is alleged to look after the function of the rest of the autonomic system. Eppinger and Hess[38] teach that the entire vegetative nervous system is controlled by the glands of internal secretion. The normal functions of the viscera depend, according to this theory, upon an interaction between two contrary forces. Too much activity on the part of one, or too little on the part of the other, will result in either motor or secretory inhibition or stimulation, and may bring about a condition of disease.

Increased tone of the autonomic system—"vagotonia"—may be diagnosed, it is said, by the reaction to pilocarpin. Those who react to 0·01 g. hypodermically by sweating and salivation are "vagotonic." They will probably suffer from hyperacidity, eosinophilia, bradycardia, mild arrhythmias, and sluggish action of the bowels. The authors give a description of patients having a "vagotonic disposition." They are "nervous invalids." The starting point for the whole theory is the assumption that, since adrenin acts as a tonic continuous stimulus to the sympathetic, there must be some substance which performs an analogous function for the cranial and sacral autonomic fibres. As we have seen, the tonic theory of adrenin function has had to be abandoned, and so the argument for the existence of "autonomin" falls to the ground.

According to certain authors who have accepted the teachings of the Viennese school, the internally secreting glands may be divided into those which act with the sympathetics (adrenals, thyroid, pituitary) and those which act with the parasympathetics (parathyroids, pancreas, duodenum). The sympathetic nerves and the sympathicotropic glands aid in the defence of the organism against enemies from without. The parasympathetic nerves and parasympathicotropic glands provide the body with an appetite, with the secretions for the digestion of the food, and with motor stimuli for the alimentary tube.[39] This is the kind of wild theorising which has become common on all matters connected with internal secretion. I have recently called attention to an example of rash speculation connected with the function of the chromaphil tissues.[40] In the communication in question, anxiety and apprehension in the pregnant mother are supposed to result in excessive sympathetic stimulation. This leads to hyperadrenalism. This again gives rise to hypertrophic pyloric stenosis in the offspring!

One other similar case may be quoted. A recent contributor to the subject of disturbances of the endocrine glands states that "a diagnosis of a disturbance of the suprarenal glands was based on the bladder irritability, profuse perspiration, the almost anaphylactic puffings and swellings and the sluggishness of the peristalsis of the bowels"![41] It will be observed that in these two examples, as is almost always the case, the whole problem of the function of the adrenal bodies is assumed to be wrapped up in the activities of the adrenin.

There are many problems which I cannot even refer to on the present occasion. I find it difficult, however, to leave the subject without a few words on the work of Dr. Thomas Addison in 1855. The report is a model of what a clinical and pathological investigation should be. Addison's disease is still the only well-defined syndrome recognised as connected with the adrenal bodies. It is sad to have to admit that up to the present time it has not been possible to correlate in any certain manner any of the physiological observations on the glands with what we know of the symptoms of Addison's disease. It may be, after all, that disease of neighbouring nervous structures plays a part in the production of the disease.

The pioneer work of Oliver and Schafer, interesting and valuable as it is, has not yet led to an understanding of the functions of the glands. It has led to the discovery of a valuable drug—adrenin—and it has taught us the pharmacological action of certain amines. The function of the adrenal bodies is probably wrapped up in the activities of the "cortex" and not essentially connected with the formation of adrenin.

(b) The Thyroid Gland.

Turning to the thyroid, we find ourselves able to put forward a hypothesis based on sound experimental and chemical research and supported by a large amount of clinical evidence. The thyroid gland secretes a substance *thyroxin* (recently isolated by Kendall[42]) which is poured into the blood-stream and acts as a catalyst, bearing a quantitative relation to the production of energy within the tissues. The absence of the substance does not necessarily produce death, but merely a lowering of the level at which energy can be produced. The chemical reactions occurring after administration of thyroxin are essentially the same as those which occur in its absence. As a catalytic agent all it does is to increase the rate at which these fundamental reactions are carried out. It is suggested by Kendall that the thyroid gland has been added to the animal organism in order to permit a greater range of flexibility of energy output.

When thyroid deficiency is well marked, as in a typical case of myxœdema, diagnosis is easy, and the treatment by thyroid gland substance is, perhaps, more satisfactory than in any serious disease known to us. This is the more remarkable in that it seems clear from experiments on animals that myxœdema is not due simply and solely to thyroid deficiency. Some of the most striking symptoms of the disease cannot be induced by extirpation of the gland in animals. On the other hand, there is a serious tendency towards rash diagnosis of minor degrees of thyroid deficiency. The conception once reached that thyroxin helps to maintain an adequate metabolic rate, it seems difficult for practitioners to realise that many other causes may contribute to a condition of sluggish metabolism. For myxœdema we have, then, a valuable remedy in thyroid substance administered by the mouth. In exophthalmic goitre, where it is generally conceded that we have to deal (among other factors) with hyperactivity of the thyroid, no such easy treatment is possible,¶ and it is frequently necessary to resort to surgical interference. There can be little doubt that in a large number of cases such interference restores the patient to comparative health and comfort more effectually than any other known mode of treatment.

(c) The Pituitary Body.

Since the publication of Cushing's work[43] in 1912, the literature of the pituitary body has grown to enormous proportions, but our knowledge of the

¶ Though Edmunds believes that the condition depends partly on loss of calcium and that the direction in which a cure should be sought is by the administration of calcium, or possibly of strontium.

functions, normal and pathological, of this structure is still comparatively slight. Progress is likely to be slow; let us do all in our power to make it sure. At present there is a dangerous tendency to assume that any particular case of adiposity or infantilism must be due to some disease of the pituitary body. The subject of pituitary disorders—complicated enough even on the assumption that it can be dealt with by itself—is rendered infinitely more so by the fact, now generally recognised, that the pituitary problems are intimately related to those of certain other glands. The recent work of Camus and Roussy[44] and of Bailey and Bremer[45] seems to indicate that many, if not all, results usually attributed to lesion of the pituitary body are really due to damage to the base of the brain. If this is the case, we shall be forced to a re-consideration of our whole attitude in relation to the pituitary body. There still remains a vast amount of work, physiological as well as pathological, to be carried out before we can hope to set the medicine and surgery of the pituitary body upon sure foundations.

(*d*) *The Parathyroid Bodies.*

Recent work seems to indicate that the parathyroid glandules control muscle tone by keeping down the amount of some toxic substance in the circulating blood. This substance, according to Paton,[46] is guanidin, and the hypothesis is that the glands control the metabolism of guanidin by checking its production or by bringing about its conversion into creatin. As for the pathology of the parathyroids, there has been too great a hurry to assume that all kinds of "tetanic" disorders are due to parathyroid lesion or dysfunction.

(*e*) *Secretin.*

The "hormone" theory of pancreatic secretion, first put forward by Bayliss and Starling,[47] was supported by very convincing and very careful experiments, and it has been almost universally accepted. In one respect the original hypothesis has had to be modified. Not only acid, but water and oil, by their presence in the intestine, will call forth a secretion of the pancreatic juice. Recent work by Dodds and Bennett[48] has shown that there is a fall of alveolar CO_2 pressure (below its original fasting level) in the later stages of digestion. It seems very probable that this must be due to the secretion of pancreatic alkali into the gut. Now this alveolar response does not differ materially with substances of varying reaction. Further, since perfect health can be maintained in cases of complete achlorhydria, it is justifiable to conclude that the formation of secretin by acid is not an essential factor in pancreatic secretion.

For some few years after the publication of the work of Bayliss and Starling, certain writers were in the habit of assuming that under normal conditions any nervous influence upon the flow of pancreatic juice is absent or negligible, and that the mechanism is purely and simply a chemical one. But it has been known for some years from the work of Pavlov and his pupils that, if proper precautions be taken, stimulation of the vagus will call forth a secretion of pancreatic juice, even when the flow from the stomach is prevented. Moreover, the flow from the gland may be inhibited by nervous influences, also through the vagus. Further, in the dog, the pancreatic juice begins to flow within a minute or so after the ingestion of food and before any gastric contents can have passed into the duodenum.

Many writers now assume that there are two kinds of pancreatic secretion, a nervous and a chemical. As to the precise part played by each of these in normal conditions it is too early to dogmatise.

(*f*) *The Thymus.*

From a review of the recent literature one is led to conclude that the function of the thymus is antitoxic. There seems to be no reliable evidence that "mors thymica" is due to abnormality of the thymus. The variations in the results of experimental work on the organ may probably be explained as a result of a reduced resistance against external injurious factors which differ under different conditions of age, nutrition of the animal, nature of surroundings, &c. Hammar,[49] who has given considerable attention to the morphology of the organ, considers that it is fundamentally an epithelial organ infiltrated with leucocytes. It persists as a functioning gland throughout life, although at puberty an "age involution" begins. Usually the parenchyma is reduced in disease, and even in healthy subjects the thymus is a very labile gland. It is scarcely necessary to point out that this is very different from the current conception of the morphology and physiology of the gland.

(*g*) *The Gonads and the Pancreas.*

In the cases of organs supposed to furnish both an external and an internal secretion, it was natural to assign these two functions respectively to different kinds of tissue if such could be found in the organs in question. In the reproductive organs it is the "interstitial" tissue which is usually assumed to provide the internal secretion, while in the pancreas the islets of Langerhans are commonly charged with this function. The evidence that such is actually the case is by no means convincing in either organ. In the pancreas, I am not prepared to admit on the evidence before us that the islets are organs *sui generis*, nor am I persuaded that the internal secretion of the gland is furnished solely by these structures.

7. ORGANOTHERAPY.

One of the most striking results of the popularisation of the idea of internal secretion which, as we have seen, was the work of Brown-Séquard, was a revival of the ancient mode of treatment known as opotherapy or organotherapy. The theory on which much of this treatment is based has been compared by Cushny[50] with the belief of the savage that the courage of the lion may be acquired by devouring the heart of that animal. This creed rendered into modern "hormonese" would read somehow thus: That oral administration of extracts from the myocardium of certain carnivores would serve to reinforce or replace the hormones in the heart which have become deficient. In this way the vigorous tone of the heart muscle might be restored.

In the very interesting introduction to his work on organotherapy, Batty Shaw[51] recalls that "in remote ages, when religion and medicine were more closely associated than they are now, the use of the organs of animals as special forms of sacrifice was a common practice, as it was thought that some divine intervention might be invoked; as a sequel, in which may be traced a very human desire for some certain practical benefit that might be derived from such sacrifice, the officiating priest was allowed to make use of part of the sacrifice for his own purposes as food. With the advent of the scientific methods of Hippocrates, the study of the efficiency of various organs as remedial agents apart from any use as sacrifices was developed, and Celsus and Dioscorides recommended the use of various animal organs for the relief of those symptoms in man which were considered to be due to defective action of the same organ; hence the use of the pigeon's or wolf's liver for hepatic disorder, the brain of the hare for tremors, the lung of the fox for dyspnœa, and the use of rennet for disorders of the stomach and abdomen generally. Pliny recommended the use of the testicles of the donkey and of the stag as aphrodisiacs, and to this day there still remains the practice of employing castoreum for menstrual disorders. Nor was the use of organs always of a beneficent order, for darker agencies were thought to be invoked; and so we read the following prescription:—

> 'Fillet of a fenny snake,
> In the cauldron boil and bake;
> Eye of newt, and toe of frog,
> Wool of bat, and tongue of dog,
> Adder's fork, and blind-worm's sting,
> Lizard's leg, and owlet's wing,
> For a charm of powerful trouble
> Like a hell-broth, boil and bubble.'
>
> *Macbeth*, Act iv., Sc. 1."

It is little wonder, when in some organs powerful physiological principles began to be discovered, that the practice of the methods of organotherapy should have undergone a great revival. Some flagrant examples in modern times of an uncritical application of the method are the treatment of heart disease by means of extracts made from heart muscle, the subcutaneous injection of extracts of ciliary bodies in iritis, and of synovial membranes in diseases of the joints. The effects of such naïve creeds and crude practices upon the commercial aspects of therapeutics have been very striking. Manufacturing druggists have not been slow to avail themselves of the supreme opportunity which the present trend has offered. There is scarcely an organ or tissue in the body which cannot be obtained in elegant form for administration. We meet with advertisements of extracts of blood (hæmoglobin), bone marrow, muscle, spinal cord, brain, lymphatic gland, spleen, prostate, ovary, testis, mammary gland, duodenum, pancreas, liver (bile), placenta, gastric mucous membrane, and kidney, to say nothing of the adrenal body (both cortex and medulla, and the whole gland); thyroids and parathyroids, pituitary (both anterior and posterior lobes and the whole organ), the pineal body, and the corpus luteum. Various mixtures of these extracts are also put upon the market and presumably sold, as—e.g., ovary and mammary gland extracts, mixtures of extracts of lymph gland, testis, spinal cord, and brain; combinations of thyroid and pituitary, and of thyroid and adrenal body; such combinations as "polyglandin," a mixture of thyroid, parathyroid, ovary, testis, and pituitary.

With the exceptions of the various preparations of the adrenal bodies, the thyroid and pituitary bodies, these animal substances have not been shown to possess any specific characters or to exercise any definite physiological action on the economy. Their continued and indiscriminate exploitation constitutes one of the worst forms of present-day quackery. Although the work of Brown-Séquard on testicular extracts undoubtedly called attention to an interesting field of therapeutical inquiry and aroused a widespread curiosity concerning the whole subject of internal secretion, there can be little doubt that the work was not worth much for its own sake; and testicular extracts, of which I imagine hundredweights must be sold annually, are most probably quite worthless as therapeutic agents.

Manufacturing druggists are not the only, nor, indeed, the chief offenders in this matter. They after all only push upon the market what they are likely to be able to sell, and their prospect of sale depends on the recommendations of physicians. It is our duty, therefore, to be much more critical in drawing conclusions from an apparent beneficial effect of the administration of extracts of organs and tissues. As pointed out by Cushing this is all the more necessary when more than one kind of substance is given at one and the same time. It is sometimes urged that the body will pick out the substance it needs and will discard the others. This kind of argument has influenced therapeutic practice throughout the ages, but it is of doubtful value and needs the check of careful observation.

There is a special need of great caution when the substances are administered by the mouth. With the exception of those from the thyroid, it is very doubtful whether any of the organic preparations have any action, physiological or therapeutical, when given in this way.

It has been pointed out that the present day *furore* over organotherapy is comparable to the plant pharmacology of the Middle Ages (Cushing, loc. cit.) based on the "doctrine of signatures." A patient is bilious—therefore he has some disease of the liver. The leaves of a certain plant resemble in their colour and general appearance the surface of the liver—therefore a concoction of these leaves is good for biliousness, and the plant comes to be called *hepatica*.** But, lest there should be any mistake, several other substances are added to the concoction. The shrewdness discoverable in this method of the Middle Ages is present also in the behaviour of the modern manufacturing druggist. The compound preparations very frequently contain some thyroid substance, and this is probably the only one which has any definite action when taken into the stomach (Cushing).

The medical press is crowded with articles on the alleged benefit of organic preparations. The majority of these contributions can only be described as utter nonsense, and are only fit, as indeed they are frequently destined, to serve the cause of advertisement. It is difficult to treat seriously such paragraphs as the following:—

"To-day, to-morrow, and the day after are foreordained to the physiologist, the physician, and the therapist. Their hour has come through the agency of the internal secretory glands, which already unfold before the astonished gaze of the seeing eye a land of promise, beside which the vast territories conquered by Lister and Pasteur are destined to pale into honourable insignificance."

Or again:—

"The ductless glands and their hormones come to us as peaceful conquerors who brook no denial. They lighten our darkness and show us apparently miracles. In studying them and endeavouring to unravel their intricate and esoteric mysteries one seems ever and anon to be on the trail of the 'Great Secret,' and in danger of losing one's mental perspective."

Again we read that—

"The pituitary, we have found, controls all functions based on periodicity—menstruation, the rhythm of poetry and music, punctuality, neatness, order—all of these have their origin in the pituitary. We find clinical corroboration of this in diseased conditions of the gland, when a sudden fondness and aptitude for music make their appearance simultaneously with a new growth which activates certain secretions of the pituitary."

Still another example:—

"In diagnosis it is no longer a question of bimanual examination, of listening to the lungs, to the heart, testing the blood pressure, examining the urine, examining the blood, &c. It is a matter of observation and also of tests to determine what the endocrines have been doing to a patient before she come to us, and then it is for us to determine what the endocrines are doing at the time the patient consults us; and if the patient suffers from too little of a secretion necessary to her well-being, what is easier than to administer it?"[53]

Amusing as it might be it would not be profitable to quote more of this stuff. As Cushing[52] humorously puts it, "The Lewis Carroll of to-day would have Alice nibble from a pituitary mushroom in her left hand, and a lutein one in her right, and presto! she is any height desired." But the reaction has already set in; so vigorous has been the counter-attack in some quarters that the editor of *Endocrinology*, a journal devoted to the subject of internal secretion, has thought it necessary to defend his subject against some too iconoclastic critics. There is, indeed, serious danger that the nucleus of sound knowledge which justifies a belief in the doctrine of internal secretion may be jeopardised by a too drastic destructive criticism, in the same kind of way that, when phrenology was exploded by Flourens in 1822, brain physiology was so seriously injured in the fray as not

** The term "sympathetic magic" is now applied to beliefs and practices which depend upon an exaggeration or distortion of the importance of similarities ("homœopathic" magic) or upon the supposed persistence of properties assumed to be gained through contact or possession ("contagious" magic). Sympathetic magic is general amongst savage peoples, but it is very far from extinct in civilisation, especially in war-time. The savage need not eat the heart of his enemy, if he can make his hair into an arm-band, or attach it to his shield, and so add the valour of his enemy to his own. During the European war the protective value of fragments of enemy shell was believed in, and they were worn or carried as amulets. Amongst our own peasants, moles' feet are carried to cure cramps or rheumatism, and bat's wings to ward off or improve failing eyesight. The association is in these cases obvious, but why a potato carried in the pocket should keep away rheumatism is not so clear: the active principle is elusive. There can be no doubt that the mind of civilised man easily lapses into carpet slippers, and we may regard a mascot on a motor-car as a symbol of the down-at-heel mentality of others besides the owner of the car.

to recover for close upon half a century. One hears cynically inclined onlookers and medical scoffers suggesting at the present time that we should encourage the vitamins in order to keep down the plague of endocrines, and prophesying that sooner or later some new fad will be welcomed whose function it will be to relieve the strain of vitaminology.

8. CONCLUSION.

In the minds of many physiologists there is a growing suspicion that the chemical regulation of the bodily functions is not of the supreme importance that certain schools would have us believe. I would urge that if the subject of internal secretion, in both its clinical and its physiological aspects, is not to fall into utter disrepute, it must be treated with infinitely more of scientific discrimination than has hitherto been the case. The ordinary criteria of evidence must be duly regarded, and workers in all fields must realise the necessity for adequate and rigid control experiments.

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EPIDEMIC DIARRHŒA.

AN ANALYSIS OF 84 FATAL CASES.*

BY DONALD PATERSON, M.B., M.R.C.P.,

PHYSICIAN TO THE OUT-PATIENT DEPARTMENT, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

With a BACTERIOLOGICAL REPORT ON 41 CASES OF EPIDEMIC DIARRHŒA.

By DAVID NABARRO, M.D., F.R.C.P.,

DIRECTOR OF THE PATHOLOGICAL DEPARTMENT OF THE HOSPITAL.

EPIDEMIC diarrhœa, or epidemic enteritis, is a disease affecting infants and very young children during the months of July, August, and September, and sometimes October. It is characterised by an acute gastro-intestinal upset, with diarrhœa and vomiting, a low blood pressure, collapse, dehydration, symptoms of intoxication, or symptoms resembling shock. There is a high mortality. The ætiology remains indefinite. What part bacterial infection plays—whether it is a primary cause or whether merely of secondary importance—is not known. Whether this disease be due to the action of bacteria on the food, either before or after ingestion—whether or not there are several diseases grouped under this one term—whether we are really dealing with one of the so-called filter-passing virus group remains to be proved.

In dealing with a disease in which the chief symptoms, those of diarrhœa and vomiting, are common to so many other diseases, the difficulties of making a correct diagnosis are great indeed. I propose, therefore, to base my remarks on the findings in 84 cases which came to post-mortem during the summer and autumn of 1921. In this way I exclude such diseases as cerebro-spinal fever, pneumonia, or empyema, pyopericardium, and other conditions which may give rise to diarrhœa and vomiting in infants. When we consider that out of the 297 deaths which occurred in Great Ormond-street Hospital under the age of 12 years during the year 1921 there were 73 deaths attributed to summer diarrhœa, we cannot but realise the seriousness of the complaint. The figure 73 does not include all the cases of summer diarrhœa, as a certain number were recorded under the complication which occurred during the course of the disease; the figures really ought to be 84. 147 cases diagnosed summer diarrhœa clinically were admitted during the year; of these less than one-half were discharged cured, and although this would appear a very high mortality, actually the

* A lecture given at the Hospital for Sick Children, Great Ormond-street.

(*Continued from preceding column.*)

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53. The last two paragraphs are re-quoted from Cushing (52).

figures compare well with those of any other institution like this hospital, where only the most severe cases are brought.

No real attempt has been made to go into the historical side of the question, for which I would refer you to several authors whose names are appended. The more important papers on the subject include that by Charles West, who was working at this problem more than 50 years ago. In 1885, Ballard stated that when the underground temperature at 4 ft. reached 56° F., summer diarrhœa commenced. This observation has been found incorrect by some observers, but was borne out in this epidemic. The investigations undertaken in 1902 by the Rockefeller Institute on the bacteriology of the stools forms a valuable record, and is largely confirmed by that of Ledingham and Morgan in 1908, 1909, and 1910, the results will be found elsewhere reported by my colleague, Dr. Nabarro. It suffices to say here that the findings agree roughly with those of Bloch, organisms pathogenic to adults being greatly in the minority. It is difficult to conceive that summer diarrhœa could be caused by a highly pathogenic organism without the disease showing signs of greater infectivity in the home or hospital, and one might conclude that the occasional infection seen from one case to another is caused by the occasional case of real typhoid or dysentery.

Previous Health.—There was a clear history of previous digestive trouble in 39 cases out of 84, while in the remaining cases they would appear to have been attacked when in a healthy condition.

Food on which they were Fed.—An examination of the foods used will show that all types of feeds have

CHART 1.

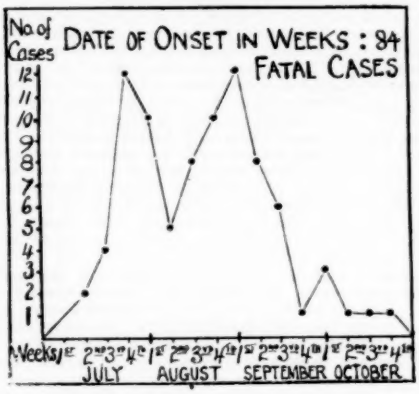
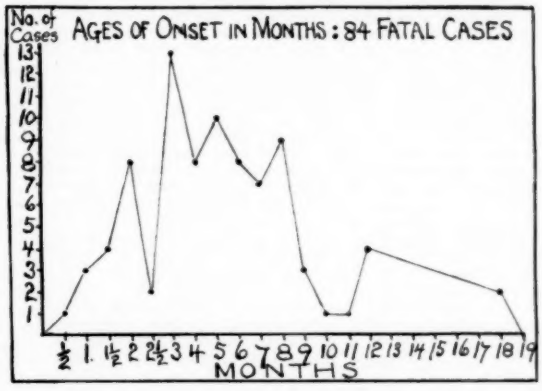


CHART 2.



though the organism described was different. Edward Mellanby's work (1916) seemed to prove the condition under which the maximum and minimum amount of a toxin may be absorbed from the bowel; but the relation of this toxin to summer diarrhœa was by no means proved. His paper was nevertheless valuable, in that it gave scientific support to methods of treatment which we have known empirically to be correct for many years. Bloch, in 1920, pointed out that Finklestein and Czerny's theories place the bacteriological activity more or less in the background, and trace all the symptoms of infective diarrhœa to the chemical action of food and its decomposition products. He remarked that these theories have involved their sponsors in a tangle of contradictions, from which many authorities are straying back to the simpler theory of infection. He concluded that the clinical picture, the pathological findings, and the epidemicity are the same whether pathogenic bacteria are found in the stools or not, and his view appears to fit in with the facts. Gastro-enteritis in infancy he attributes to infection—but not to any specific infection. In most cases coliform bacilli, non-pathogenic to adults or children over a certain age, are probably the cause of the disease. In a minority of cases the disease is due to micro-organisms pathogenic to adults. In my opinion this is the fairest summing up of the evidence that we have.

Analysis of Cases.

An analysis of 84 cases which came to post-mortem during the summer and autumn of 1921 shows the following results. The evidence of infectivity in this series is slight. Of 19 families where, in addition to the patient, there was another child under the age of 2 in the house, in only two cases did the additional child develop diarrhœa, while in the other 17 families the patient was the only case. In two cases the disease developed in hospital while under observation for some other complaint and ran a typical course. The *stools* of about one-half of the cases were examined bacteriologically either in life or at post-mortem, and suffered more or less with the exception of the breast-fed, which were in the vast minority, considering the number of breast-fed infants there are to-day: 3, breast milk only; 21, cow's milk only; 1, breast-fed and cow's milk; 1, breast-fed and Glaxo; 19, Glaxo; 1, Ambrosia; 6, Cow and Gate; 1, Savory and Moore; 2, Benger's; 5, Allenburys; 1, cow's milk and Benger's; 17, Nestlé's; 1, Nestlé's and Ambrosia; 4, a mixed diet for a child over 1 year; 1, mixed diet and Nestlé's. The supporters of the theory that the infection is conveyed in the milk will receive very little help from these figures. In the majority of cases the feed was made up just before being given, and dried foods show as a rule a much lower bacterial count than ordinary cow's milk sold in London. That the teats may have been contaminated cannot be combated. In five cases fatal diarrhœa and vomiting followed immediately on weaning.

Date of Onset of 84 Fatal Cases.—There were few cases prior to the third week in July; then a sudden rise occurred. (See Chart 1.) This corresponded with the ground temperature at a 4 ft. depth reaching 56° F. (on July 26th last year). There was then a rapid fall, then another rise which reached its maximum early in September. John Brownlee believes that there are two epidemics, the first in July and August, which has a sharp rise and fall, and the second in September, which he calls autumn diarrhœa, with a more gradual rise and fall. Brownlee, however, thinks that we have ceased to have the first type of epidemic. Holt shows a chart in his book in which the maximum incidence of the disease is in July and falls rapidly from that point. This is entirely unlike the incidence shown in this country.

Sex.—There were 53 males and 31 females in this series, which agree with the findings of other observers as to sex incidence.

Duration of the Symptoms before Admission to Hospital.—24 cases had been ill more than 2 weeks; 16 cases, 2 weeks; 4 cases, 10 days; 13 cases, 7 days; 27 cases, less than 7 days. The length of the illness before the child was brought to the hospital may in

some way explain the large number of fatal cases which I am recording; at least half the cases were brought to hospital in a moribund condition.

Age of Onset.—The maximum number of cases were aged 3 months, and this number remained at the same level until the age of 9 months was reached, when there was a sharp fall. (See Chart 2.)

Pathology.

The time elapsing between death and necropsy—especially in summer—may play an important part in altering the pathological picture. A fairly large proportion of the cases were examined within 12 hours and 10 per cent. within four to six hours of death.

Pathological Changes in the Liver and their Significance.—In this organ was found the commonest lesion demonstrated at post-mortem. This was a fatty change of a greater or lesser degree, and found in 66 cases out of the 84.

For purposes of recording the degree of change the following terms were used: Slightly fatty (5), fatty (10), very fatty (51). Sixty-six cases thus showed fatty change in the liver to a degree that was distinctly pathological, while 51 showed fatty changes so gross that they formed a most unusual picture. On inspection, the liver was firm, yellow, lemon-tinted, or even canary-yellow. On section the whole substance was yellow and homogeneous. Microscopically the liver cells were distended with fat so that the cells were spherical and their nuclei flattened against the cell wall. Usually the fat was evenly distributed throughout the lobule, in the slighter degrees, however, the centre was more affected. In some cases the typical "signet-ring" appearance could be seen, but in others the liver cells themselves seemed to have suffered degeneration and both the nuclei and remaining cytoplasm stained badly. Because of a shortage of assistance only a sufficient number of livers could be sectioned to control the naked-eye findings.

How far this condition of the liver was due to the disease itself, or how far due to the treatment—starvation—it is difficult to estimate. The vast majority of these children were fed on glucose water—a 7½ per cent. solution—and those with air-hunger were given alkalies, this treatment apparently having no effect in changing the pathological picture. It would seem, then, that whatever the fatty change was due to, it was of such a severe degree as to be incompatible with life, and this would point to a line for future work on prevention and treatment.

The least liver damage or fatty change was found in those cases which had had a history of chronic indigestion and had developed during the summer season an outburst of acute diarrhœa. Seventeen of these cases showed no fatty change at all. In all cases where the diarrhœa had come on in the previously healthy children, with one exception, the liver showed well-marked fatty change. It was in this latter type of case that all the grossest examples of liver damage were forthcoming. It seems unlikely that starvation alone can cause this change in all children, as in the classically starved child with pyloric stenosis it is the exception to find more than a moderate degree of fatty change, and I have never seen the liver exhibiting the picture which was shown in the above cases.

Intestinal Lesions and their Significance.—In some cases the intestines appeared to be perfectly normal. In other cases, especially those with a previous history of indigestion, there was present what is so often described as a catarrhal enteritis with an excess of mucus. These cases were not included in the group showing a lesion, as in my opinion this catarrhal change was too indefinite to record. The changes recorded are of cases showing definite congestion with petechiæ, congestion alone not being sufficient. Others showed definite ulcer formation, either very small ulcers, often situated along the attached border of the mesentery, or larger punched-out, or shallow and irregular ulcers. Others showed a so-called membranous colitis, where the superficial layer of the mucous membrane seemed to be sloughing in large flakes, and this slough was often grey or stained by bile. Frequently, high up in the small intestine, the surface of the bowel assumed what I have called a "flannel" appearance. Here the surface was roughened and the superficial layer of mucous membrane showed erosion, with numerous small petechial hæmorrhages. As the cæcum was approached the picture became more and more gross, until quite large petechial hæmorrhages were present, the lymphoid tissue became more prominent and the surface more definitely eroded. Often in these cases only the commencement of the colon showed this change, but in other cases a somewhat similar appearance was present throughout. Microscopically sections through the ulcers in two cases showed polymorph-leucocytic infiltration of both the submucosa and also into the actual muscle tissue itself. Frequently the lesion was confined to the large gut, and this was especially so where there was ulcer formation. The bowel in these cases showed induration and thickening as well.

Of the 45 previously healthy cases 18 showed a definite pathological lesion. Twenty-seven showed no lesion of the intestine to the naked eye—that is, 40 per cent. of the acute cases showed a lesion. In the 39 cases with a history of indigestion, 18, or 46 per cent., showed a definite lesion. That the lesion did not appear merely from the length of the illness and fail to appear in others, because the illness was of too short a duration, is shown by the following facts. Of the 45 previously healthy cases the 18 cases with lesions present had an average illness of 2·3 weeks, while in the 27 cases without a lesion the average illness was 2·5 weeks. Of 39 cases where there had been a previous history of indigestion, in the 18 showing a lesion the average duration of the illness was 4·6 weeks, while in the remaining cases where there was no lesion the average duration was 4 weeks.

It may be seen, then, that the duration of the disease did not apparently play any important part in the establishment or non-establishment of these pathological lesions.

Kidneys.—In those cases in which the liver was affected the kidney showed a definite fatty change. The lesion may be described as a cloudy swelling, going on in most cases to fatty degeneration, and the parenchyma appeared to be damaged to an extent which might be described as true parenchymatous nephritis in some cases. In these cases there was swelling and desquamation of the cells of the tubules and the cytoplasm and nuclei took on the stain badly or not at all. The urine bore out this lesion and a cloud of albumin and epithelial casts were found present in a number of cases. In no case was blood found in more than the most minute quantity. Occasionally the urine contained acetone and diacetic acid. In 6 cases of summer diarrhœa having well-marked albuminuria, with casts, while in hospital during 1919, and observed again after two years' interval, none showed the slightest trace of albumin and all appeared in perfect health.

Mesenteric Glands.—In this respect my findings were different from those of others who have reported on this point. In the vast majority of cases there was no enlargement, or it was so slight that it could not be ascertained with certainty. In the grossest cases with ulcer formation and colitis, however, there was always a certain degree of enlargement, which tended to be more constantly present in the previous healthy cases. The practical difficulties of determining enlarged glands in a wasted child, where the fat has largely disappeared from the mesentery, and where the glands had become unduly prominent on that account, is a task which seemed too difficult to be undertaken with any hope of accuracy.

Spleen.—This organ, so far as I could make out, showed no other than the so-called toxic changes which might be seen in any acute febrile disturbance.

Heart.—This organ, in the cases with chronic wasting, showed the typical picture seen in any marasmus, tortuous coronary vessels, the muscle being markedly wasted. In those cases where the liver and kidney showed marked fatty change the heart was pale and showed cloudy swelling, and in one case sectioned showed actual fatty degeneration. Beneath the pericardium in these toxic cases there were small petechiæ, and the picture resembled that seen in a case of septicæmia.

Brain.—In 15 cases an examination of the brain was allowed, in seven of which it appeared perfectly normal. In six cases it appeared extremely congested, salmon-pink in colour, the surface being covered with small petechial hæmorrhages. Four of these examined microscopically showed extreme congestion only, no signs of inflammation. In two other cases there was gross damage to the brain substance—a thrombosis of the lateral and straight sinuses, with hæmorrhage into the brain substance. These had shown clinical symptoms which had pointed towards a cerebral lesion before death.

Lungs.—In eight cases broncho-pneumonia was found post mortem; in 17 the lungs showed marked congestion; in four there were petechial hæmorrhages beneath the pleura; in three there were signs of old pleurisy; in one a small amount of pus was found in the pleural cavity, and a smear showed pneumococci. The petechiæ were found in the so-called "toxic" variety of case, where the liver showed the grossest fatty change.

Complications.—In determining whether any post-mortem finding occurred as a complication, or was the original cause of the whole illness, valuable help is obtained from the history, symptoms, and physical signs. Probably the most important group of complications were five cases of peritonitis. The children were admitted to hospital for wasting and diarrhœa. One was admitted moribund with a history of five days' acute diarrhœa and vomiting, and died on admission. The other four cases showed well-marked diarrhœa but no pyrexia, and after being in hospital from one to three weeks, developed symptoms of an acute infection, ran

a high temperature, finally dying in 18, 17, 10, and 14 days respectively after the onset of the acute fever. These four cases had repeatedly had intraperitoneal salines, the majority of the cases being treated with intraperitoneal salines throughout the summer.

Clinically these cases resembled summer diarrhœa, with the exception of one case where the abdomen seemed so prominent that peritonitis was suspected. At necropsy the pictures were almost identical except in degree. The abdomen contained several ounces of thick felted fibro-purulent material. The intestines showed very little œdema, and although the peritoneal surface had lost its lustre and was congested it suggested, a very mild peritonitis only. Nothing was found to indicate that infection had travelled in by the tracts of needle wounds. The bacteriology of one of these cases showed a mixed infection, *B. coli*, Gram-negative bacilli, and a Gram-positive diplococcus in the smears submitted. The fifth case, which had had no intraperitoneal saline, died on admission. The abdomen in this case was noted to be full and the history was that of marked diarrhœa and vomiting for five days. The necropsy picture was exactly similar to the other cases. The organism isolated was *B. coli*, anaerogenes type, obtained in pure culture.

It would seem, then, that these children with one exception were admitted with chronic diarrhœa and indigestion, and while in hospital developed symptoms of an acute infection. They lived some days after this infection appeared, and the question is whether they developed peritonitis from the bowel infection or from the intraperitoneal salines. On the other hand, a case came in, during this same period, which had not had any saline and yet presented the same pathological picture, and on culture the prevailing organism of the epidemic was obtained from the pus, in the peritoneum. Denzer and Anderson quote cases of "sterile peritonitis" or inflammation, secondary to a reaction aroused by intraperitoneal saline. They do not, however, describe a picture quite like the one seen here. Judgment should be reserved until this point is definitely cleared up; at any rate, that peritonitis may be a complication of summer diarrhœa remains a possibility in favour of which there is a certain amount of evidence.

Other complications noted were empyema (1), sinus thrombosis (3), convulsions (5), œdema (2), purpura (1), thrush (4), sclerema (4). These sclerema cases had run the usual course with a high temperature and much dehydration, when the child was noted after the symptoms and fever had disappeared to be going "hard" all over. The temperature became subnormal, the muscles and skin seemed to be bound together so that the skin could not be picked up. The arms, legs, abdomen, and back were stiff and hard and could not be bent. There was no definite pitting and the impression was that of a brawny œdema. Death followed in all cases. This condition is fully described as a complication of summer diarrhœa by Langmead. One of these cases with a control was kindly investigated by Dr. J. W. McNee, who notes that histologically the subcutaneous tissue showed no gross abnormality. The fat which appeared normal was diminished in amount, the fibrous stroma consequently appeared more prominent. The melting point in the case of sclerema was 38·5° C., being higher than the normal temperature (37° C.), and thus the fat in this case remained solid. The melting point in the control case was 32·5° C., and consequently semi-fluid.

Symptoms.

There are apparently two definite groups in this series. The first group consisted of those in which there was a history of previous indigestion, diarrhœa, and failure to gain weight. This type of child might have two or three green undigested stools per day, but otherwise appear quite bright. Definite diarrhœa developed suddenly with many watery-green, slimy, undigested stools. Occasionally there was vomiting. This child became rapidly more wasted, the skin being inelastic, the fontanelle depressed, and the eyes sunken. The face was pinched and the expression that of an acute abdominal condition in an adult. The temperature, hitherto normal, now rose to 100° or 101° F. or more, and the child became restless or drowsy by turns. The picture at this stage was identical with the stage of intoxication described in the next group, and quite different from the so-called terminal diarrhœa of this class of case during the winter months.

The second group was that of an apparently healthy child suddenly attacked by diarrhœa. There was usually a history that the child had vomited several feeds, and was feverish before the diarrhœa commenced. The motions were green, gradually becoming smaller, until eventually they consisted of mucus with small amounts of intestinal débris, the whole being bile stained. This was the nearest approach to the so-called "cholera infantum" group described by most writers. The child's appearance was changed in a few hours, the abdomen became scaphoid, the eyes sunken, the fontanelle depressed, the tongue dry. This was the stage of "dehydration." Early in this stage it became restless, rolling its head from side to side, and looking about anxiously for sips of water. In the later stages of dehydration the child became semi-conscious, and failed to recognise anyone, lying in a stupor and breathing rapidly. Slight cyanosis was present over the face and extremities, accompanied by a high temperature. This was called the stage of "intoxication." Gradually the child would sink into a coma and remain so until death. If vomiting was present to any degree it was present in this type of case. In the deeply intoxicated stage, or before or after the stage of restlessness, with "air-hunger," this child could not be distinguished clinically from the case of chronic indigestion described above, which had become dehydrated, and passed into the stage of intoxication. The temperature of this second group was always high, although they might have been admitted in a collapsed state, the face, nose, hands, and feet being cold and blue. That the dehydration was rapid was shown by the fact that in one case there was a loss of four pounds in a single week. The skin hung in folds on the thighs in these cases, giving evidence that the wasting was recent.

True "heat-stroke" was shown occasionally by a sudden convulsion, which sometimes persisted until death, neither diarrhœa nor vomiting having occurred. These cases were rare. In other cases the convulsions took place late in the stage of dehydration. 49 of this series were admitted in a collapsed intoxicated state, either having passed into the stage of coma, or being well into the restless state due to dehydration. The average duration of the illness in the first group of chronic indigestion children, after the acute illness started, was 4·3 weeks, and the second or acute group 2·4 weeks. 17 cases were admitted in a state of apathy, dullness, or coma. In eight cases the feature was a series of relapses; the child seemed to do well on starvation diet of glucose water, but when given anything more substantial, the temperature rose, and the child showed signs of toxæmia, the picture changing rapidly to that of a desperately ill child. In 10 cases restlessness and wakefulness was a feature. Even after full doses of chloral, and warm baths, the child rolled its head from side to side, the eyes being half opened, day and night. In 15 cases there was a history of abdominal pain, and these children seemed to have spasms of pain, which made them scream out at frequent intervals, their cry often resembling that of a meningitis.

Temperature.—The temperature varied greatly in the different types of cases. In two cases it reached 99° F. only. In seven cases it reached 100°, in 14 cases 101°, in 10 cases 102°, in three cases 103°, in seven cases 104°, and in three cases 105°. In four cases the temperature was subnormal on admission, and remained so until death, while in eight the temperature was normal while in hospital.

Vomits.—In 16 cases there was well-marked, in nine moderate, in four occasional vomiting, while in the remainder of the cases there was no vomiting at all.

Air-Hunger.—In 23 cases there was air-hunger; these presented all the symptoms of "acidosis."

Stools.—The stools were variously described as green, curdy and slimy, dark green and slimy, yellow with slime, dark green and offensive, green-like chopped spinach, pale brown and watery, orange green with slime and mucus. In four cases only there was a report of blood in the stools. Two cases died before they had passed any stools in hospital. Fifteen passed about three stools in the 24 hours. Seven passed from six to ten stools per day, while the remaining 60 passed from three to six stools per day. Besides these cases of summer diarrhœa four fatal cases of typhoid fever have come under my notice, the source of the infection being known, and cases proved

bacteriologically and serologically. Other observers have noted that typhoid fever in infants does not cause the characteristic lesions seen in adults, and clinically the symptoms and signs are different in infancy, enlargement of the spleen and rose spots being absent usually. Profuse diarrhœa and vomiting occur early in the disease. I maintain, then, that as far as the clinical picture and pathological findings are concerned, that *B. typhosus* has not been excluded from being the causal organism in cases of summer diarrhœa, the main argument against it being so is the fact that summer diarrhœa is not nearly as infectious as typhoid fever or dysentery as we know it and study it in the child.

Treatment.

Remarks on treatment following reports of a very large number of post-mortem findings need some explanation. I have included them because there are certain lines of treatment, which, if adopted early, undoubtedly tend to benefit the patient to a marked extent, and there are certain methods which tend to do the patient much harm, although applicable to other forms of diarrhœa.

The treatment should in my experience be directed along the following lines :—

(1) The removal of the child from the surroundings in which it contracted the disease. This is an all-important point, as during the warm weather the hot, still atmosphere of the tenement tends to lower the vitality of the child, and the symptoms rapidly grow worse. Both in its causation and in its treatment, therefore, heat should be looked on as playing an important part. Anyone who has been through an epidemic of diarrhœa at a big children's hospital must have noticed the general improvement in the cases during a temporary cool spell of weather, and the immediate relapse during another hot spell Fresh moving air seems to help in this disease, as much as it does in the respiratory diseases of children.

(2) Make good the dehydration. The most important treatment which a hospital can attempt is the administering of salines, which is almost impossible to carry out in the child's own home surroundings. That the great part of the distress which the child seems to be suffering is due to dehydration there seems little doubt. The best method of administering the salines has been largely debated, and of late, especially in America, the intraperitoneal method has come into favour. Some of the advantages claimed are, that it is more painless, quicker to administer, and quicker to be absorbed than the subcutaneous method. The child receives the saline at a known temperature, and it has not had a chance to cool off as in the subcutaneous method, where it must pass slowly from the raised reservoir along the rubber tubing.

The dangers of wounding the bowel seem slight, and there should be little chance of introducing an infection into the peritoneal cavity. Whether the presence of the saline increases the liability for infection to pass from the bowel to the peritoneum, however, is not clear. It should be noted, however, that for some days after the operation the child will not allow the abdomen to be palpated. This method of administering saline was adopted largely during the 1921 epidemic at this hospital, although saline was also administered subcutaneously in less urgent cases. There seemed a distinct advantage in the intraperitoneal method of administration if the collapse and dehydration was urgent, but because of the risks named above, it is not a method to be used except in these cases. To administer large quantities of fluid by the mouth is rational, and frequent feeds of a bland fluid should be given.

(3) Composition of the feed. Various feeds have been tried. Albumin water, plain boiled water, barley and rice water, weak freshly brewed tea. During the 1921 epidemic, water containing a 7½ per cent. solution of glucose was used largely. It was sweet, the child liked it and would take it in large quantities; it was cheap, and contained a larger number of calories than any other form of food equally bland. The glucose water also combated acidosis, which in the acute cases with "air-hunger" was an urgent problem. Frequent small feeds whenever the child was awake seemed to be the best plan, and the children seemed to do better on glucose water than on any other feed. As stimulants for the collapse, 15 to 20 minims of brandy every four hours seemed to be of benefit to small infants, and acted as a sleep producer as well. Apart from this, we relied on the intraperitoneal and subcutaneous salines and on mustard baths for the treatment of the collapse.

For the diarrhœa, in the early stages an initial dose of castor oil was given if the child was not too collapsed. No attempt was made at this stage to stop the number of motions, as it was considered that toxic substances either from the food or from the action of bacteria were being got rid of. Later, however, either a bismuth mixture or small doses of a castor oil mixture were administered. Opium preparations were not used during the acute stages at all and seemed to be contra-indicated. Kaolin was tried on several cases without appreciable results. Intestinal antiseptics do not seem to affect this condition. Anti-dysenteric serum was given in several cases, but not in sufficient numbers for conclusions to be drawn. In certain cases the pyrexia and symptoms of intoxication abate only during starvation. Any attempt to get the child back to a feed which would support life seemed to lead to a recurrence of the symptoms. Usually the child succumbed at the first relapse, but in several cases there were three or four relapses.

Several feeds were tried with success following the initial starvation. Perhaps the most successful was well diluted, dried, malted milk—this was low in fat—and the malted carbohydrate seemed to be tolerated well. Another feed on which many seemed to do well was either veal or chicken broth, skimmed free of fat, to which lactose was added. Following this one of the dried milks was given, preferably a half cream. Fat seemed to cause a recurrence of the symptoms quicker than anything else, and the post-mortem picture of the livers seemed to offer an explanation of this fact. Some cases tended to hang on for weeks after the acute symptoms were over, and remained in a marasmic condition, some gradually sinking and finally dying of asthenia, others slowly improving and finally being discharged. These tended to return if there had been anything but the most careful feeding during the period at home.

Conclusions.

1. In this investigation the fatal cases seemed to fall into two definite groups—those with and those without a previous history of indigestion. Except for the history, these two types are indistinguishable clinically in the later stages.

2. The bowel was involved in an equal percentage of both groups and to an equal extent.

3. The duration of the disease did not influence the extent of the pathological lesion in the bowel.

4. The most constant pathological finding was a gross fatty change in the liver—this change was an almost invariable finding in the previously healthy group.

5. The infectiousness of this disease was not strikingly evident on analysis of these fatal cases.

6. Undoubted cases of typhoid fever in infants and young children may show no definite gross lesions in the bowel. *Bacillus typhosus* must therefore be excluded as the causal organism in a proportion of the cases.

7. The observation of Ballard—that the 4 ft. earth temperature reaching 56° F. is synchronous with the outbreak of diarrhœa—was borne out in 1921.

8. The feeding both during and after the acute symptoms is of the utmost importance, and that the original symptoms are reproduced when certain foods are administered in some cases.

9. The administration of salines subcutaneously, intraperitoneally, and fluids by the mouth are

essential to make up for the fluid losses and dehydration present. The intraperitoneal method, on the whole, seemed to be the best method of administration when the symptoms were urgent, and should be given at not more than 100° F. This method is not devoid of danger and should be retained for those cases in which the urgency is marked.

In conclusion, I must thank my colleagues Drs. G. F. Still, R. Hutchison, F. J. Poynton, and H. Thursfield for allowing me to use their cases.

Bacteriological Report on 41 Fatal Cases of Epidemic Diarrhœa. By DAVID NABARRO.

Of the 84 cases included in the paper by Dr. Donald Paterson, 41 were examined bacteriologically either during life, or after death, or both. Only a résumé of the results will be given here, as a detailed report will be published shortly. Owing to the large amount of material to be dealt with at times, and the lack of sufficient assistance in the investigation, the stools and scrapings from the intestine post-mortem could not always be examined as thoroughly or as frequently as would have been desirable. In consequence, many omissions will be found either in the intra vitam investigation of the stools or the post-mortem investigation of the intestines. Furthermore, in some of the cases which were examined with negative results as regards specific organisms, it is possible that a more searching examination either by the use of more plates for the primary cultures or by repeated investigations of the stools would have resulted in the isolation of an increased number of the unusual organisms to be described shortly.

Method of Isolation.—Three dry plates of Nebipelagor were used in each case. These were smeared in the usual way with mucus or blood, if present in the stool—the former after one or two washings in sterile saline or with a little of the liquid fæces. When examining the intestine, the surface of inflamed areas after being flushed with a large volume of sterile saline, was scraped with a sterile knife down to the muscular coat, and the scrapings smeared over the plates. Any colourless colonies appearing after 24 or 48 hours' incubation at 37° C. were picked off, sown in broth at 37° C., and examined for motility after five or six hours. Subcultures were then made (1) in Durham's tubes to test the action on glucose, mannite, lactose, saccharose, and maltose, (2) in milk, and (3) on agar. In special cases subsequent cultures were also made on gelatine.

Of the 41 cases that were examined bacteriologically, the intestines were alone examined in 23 cases, the fæces alone in 10 cases, and the fæces and intestines in six. In the remaining two cases neither the fæces nor intestines were examined, but in one a culture from the enlarged spleen grew *B. coli* and *B. streptococci*, and in the other the peritoneal fluid grew no non-lactose fermenters. These two cases need no further consideration, and the findings in the other 39 cases may be summarised as follows: Of the 23 cases in which the intestines alone were examined, 10 grew no non-lactose fermenters, six grew *B. coli anaerogenes*, three grew strains of dysentery bacilli of the mannite-fermenting type, two grew a *B. paratyphosus* B, one a proteus, and one an organism producing acid in glucose, some acid in saccharose, and no change in mannite, maltose, lactose, or milk. Of the 10 cases in which the fæces alone were examined, six grew no non-lactose fermenters, and one each grew *B. coli anaerogenes*, *B. paratyphosus* B (indol, O), an organism resembling *paratyphosus* B, but producing indol, and *B. proteus*. Of the six cases in which both fæces and intestines were examined, three grew *B. coli communis* and streptococci from the stools, and *B. coli anaerogenes* from the bowels; one grew no non-lactose fermenters from the stool, and the paratyphoid B indol plus type from the intestine; one grew *B. coli anaerogenes* from the stools and intestine; and one grew *B. coli anaerogenes* from the stool and a dysentery "Flexner-type" from the intestine. Adding these together we find that *B. coli anaerogenes* was isolated from 12 cases, *B. dysenteriæ* from four, *paratyphosus* B indol negative from two, and an unidentified bacillus from one case. It is interesting to note that in no instance did I succeed in isolating Morgan's No. 1 bacillus.

The organism most frequently isolated (after *B. coli communis*)—namely, the *B. coli anaerogenes*, may or may not have had any ætiological significance in the epidemic of 1921. In addition to the 12 fatal cases in which it was isolated, it occurred in several others which recovered. Several strains of the organism were met with; they practically all produced acid in glucose and mannite; nearly always in lactose in one to three days, but sometimes not till later, and occasionally not at all; in saccharose acid may or may not be produced; milk is acidified, and clotted indol, usually acid, occasionally produced. The organism is not agglutinated with a dysentery (Flexner-Y) serum. I am indebted to Dr. J. C. G. Ledingham, F.R.S., and to Dr. St. John Brooks, both of the Lister Institute, for kindly carrying out the agglutination tests.

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CIRCUMCISION UNDER LOCAL ANÆSTHESIA.

BY RICHARD ROPER, F.R.C.S. EDIN.,
CLINICAL ASSISTANT, LONDON LOCK HOSPITAL, DEAN STREET; CLINICAL ASSISTANT, UROLOGICAL DEPARTMENT, KING'S COLLEGE HOSPITAL.

THE following method of producing local anæsthesia for circumcision was originally described by Oberst and does not seem to have been much used in this country. At venereal clinics local anæsthesia by any method for this small operation is not apparently in common use. I feel that if its safety, simplicity, and completeness were better known Oberst's method of anæsthesia would be more frequently employed. Local anæsthesia is particularly useful where a medical man is compelled to work single-handed, and in places where a hospital staff is small and the services of an anæsthetist are not always available. One criticism of this method is that it may produce hæmatoma. In 400 consecutive circumcisions performed by the writer at a large venereal diseases hospital during the war neither this nor any other accident or complication was seen. The anæsthesia in the most nervous patients was excellent.

Drug to be used.—Novocain in 1 and 2 per cent. solutions is quite satisfactory, but on account of the shortage of novocain in 1917 I used the substitute kerocain, which produced uniformly good anæsthesia. About 4 c.cm. of each solution is used, which equals 0·12 g. or 2 gr. of the solid. This at first appears rather a large dose, but only one case of the 400 showed a little temporary faintness; this condition passed off quite quickly, and would most likely have occurred in this man with a smaller dose. The solutions should be freshly prepared and sterilised on the morning they are to be used; unless this point is observed the anæsthesia may be found disappointing.

I find no advantage in the addition of adrenal into the solution. The advantage gained by the temporary vaso-constriction is outweighed by the disadvantage that it obscures small vessels which must be ligatured in a part to which pressure cannot be applied. Moreover, the subsequent vaso-dilatation produced by the adrenalin adds to the unavoidable congestion following all local anæsthesia.

Syringe.—An all-metal syringe such as that used by dental surgeons is the most suitable, but a fine, sharp needle must be used—not the needle with rather a flat end which is preferred by dentists for their work.

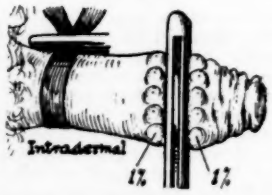
Primary Circumcision.—It is not proposed to describe the details of the operation, since any recognised method may be adopted. After cleaning the penis with iodine a sterile strip of pure rubber sheeting, about half an inch in width, is placed round the base of the penis and held with artery forceps (Fig. 1). The object of the ligature is two-fold: first, it produces a congestion which helps the anæsthetic effect, and secondly, it retards the absorption of novocain into the general circulation. The principle is to anæsthetise deep and superficial tissues separately. A solution of 1 per cent. novocain is first injected subcutaneously in a circular direction at a convenient distance in front of the ligature.

On account of the loose subcutaneous tissue of the penis it will be found that the solution tends to travel along the length of the penis as well as round it. In order to avoid this the fluid is injected at the same time as the needle is made to travel in a circular direction. When the needle has travelled as far as possible it is removed and inserted again under the skin at the distal end of the wheal raised by the first injection, and so on until the penis is encircled. The object of this subcutaneous injection is to produce a band of anæsthesia through which a needle can be inserted into the corpus cavernosum penis, as described later. The subcutaneous injection—alone, or even with injection between the layers of the preputial sac, as advocated in some methods—cannot be relied upon to produce uniformly good anæsthesia in the prepuce and its mucous membrane. A further intradermal injection of novocain along the proposed line of section of the skin is also necessary, and will be described later. Owing to the loose nature of the tissues of the penis, sufficient pressure cannot be produced on the trunk of the dorsal nerve of the penis to anæsthetise the terminal filaments of the nerve, as can so readily be done in the case of the digital nerves, which run in much tougher tissue.

FIG. 1.

FIG. 2.

FIG. 3.



To anæsthetise the deeper structures the needle is next inserted at right angles to the penis, at four different points in the band of superficial anæsthesia already produced, into the substance of the corpora cavernosa penis and 1 c.cm. of 2 per cent. novocain injected at each of the four points, as shown in Fig. 2. Care is, of course, taken to avoid the corpus cavernosa urethræ, lest the needle penetrate into the urethra. The nerves anæsthetised by these injections are the nerve to the bulb from the perineal and the branches of the dorsal nerve to the corpora cavernosa penis. The latter branches are given off before the dorsal nerve becomes superficial, and are therefore unaffected by anæsthesia produced in the main nerve at a point after they are given off. The nerve to the bulb and the branches of the dorsal nerve to the corpora penetrate the corpora cavernosum penis to reach

(*Continued from preceding page.*)

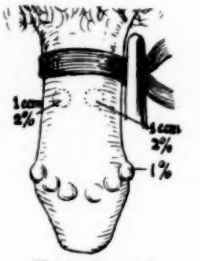
1910, v. 3, pp. 131–216; The House-Fly in Relation to Summer Diarrhœa; ibid. Parkes and Kenwood: Hygienic and Public Health, sixth edition, p. 483. Patterson, S. W., and Williams, P. E.: Epidemic Diarrhœa, M. J. Aust., v. 1, p. 460, 1921. Peters, O. H.: Observations on the Natural History of Summer Diarrhœa, Camb. University Press, 1911. Rockefeller Institute, 1904. Bacteriology and Clinical Studies of the Diarrhœal Diseases of Infancy. Rowe, O. W.: The Use of Carbo Animalis in Diarrhœa of Children, Arch. Ped., v. 35, 1918, p. 406. Royster, L. T.: Arch. Ped., v. 37, p. 523, September, 1920. Classification of Diarrhœa in Children. Sandilands: The Communication of Diarrhœa from the Sick to the Healthy, Proc. Roy. Soc. Med., 1910, v. 3, Epid. Sec., pp. 93–130. Schloss, O. M., and Stetson, R. E.: Occurrence of Acidosis with Severe Diarrhœa, Am. J. Dis. Ch., 1917, v. 13, p. 218. Sherwood, G. D.: Infective Diarrhœa and Vomiting, its Prophylaxis and Treatment, THE LANCET, 1920, ii., 906, 923. Slater: Allbutt and Rolleston: System of Med., v. 3, p. 675. Sloboziano, H.: Kidney Lesions in Choleriform Diarrhœa, Ann. de Méd., v. 9, p. 101, February, 1921. Smellie, W. G.: The Epidemicity of Bacillary Dys., Am. J. D. Child., v. 13, No. 4, p. 337. Stolkeld, E., and Loreer, A.: Brit. J. Dis. Ch., v. 15, p. 161, 1918. Webster, Reginald: Med. J. of Aust., June, 1919, p. 460. The Blood Cultures in Summer Diarrhœa. Spence, R. C.: Infective Diarrhœa in Young Children, Southern Med. Journal, v. 15, p. 189–193, March, 1922. Thomson, John: Clinical Studies of, and Treatment of Sick Child., third edition, p. 199. Thyotta, T.: Bac. of Morgan, No. 1, Meta Colon Bacillus, J. of Bacteriology, v. 5, p. 67, January, 1920. Weaver, G. H., and Tunnicliffe, R. M., Heinemann, P. G., and Michael, May: Jour. of Infect. Disease, 1905, p. 70, Summer Diarrhœa in Infants. Weiss, H.: Ætiology of an Outbreak of Infect. Diarrhœa, Arch. Int. Med., v. 28, p. 37, July, 1921. West, Charles: The Diseases of Infancy and Childhood, sixth edition (Longmans and Co.), 1874, p. 641. Young, J. H.: An Analysis of 175 Cases of Infective Diarrhœa in Infants, Boston Med. and Surg. J., March, 1911, p. 299.

their destination in the mucous membrane of the urethra and glans penis. The resistant nature of the coats of the corpora allow sufficient pressure to be produced to anæsthetise these as effectually as injection directly into the nerve itself.

The loss of sensation in the preputial mucous membrane, caused by injection into the corpus cavernosum, is so uniformly constant and good as to lead one to think that the nerves which supply the

FIG. 4.

FIG. 5.



Ventral aspect.

urethral mucous membrane also innervate the mucous membrane of the prepuce. The anæsthesia is sufficiently deep to allow of such conditions as papillomata of the glans and adherent prepuce to be dealt with without the slightest pain. To anæsthetise the skin of the prepuce intradermal injections must be made; if phimosis forceps are used they are now applied and 1 per cent. novocain injected intradermally on each side of the forceps as they grasp the prepuce. A small intradermal wheal is first formed and the skin picked up by the needle at the distal end of this and a second injection made producing another wheal, and so on until the whole line of the incision is covered (Fig. 3). About 2 c.cm. will be found necessary. If phimosis forceps are not used the skin is injected intradermally in the same way along the proposed line of section of the skin. The operation is started immediately after the last injection.

One point must be mentioned in connexion with the operation—namely, the securing of vessels. After division of the mucous membrane the ligature round the penis is released and a careful search made for divided vessels. Even if not bleeding at the time the smallest vessel should be tied, for the unavoidable congestion following local anæsthesia in about half an hour may cause quite a tiny vessel to spurt if it has not been secured.

Circumcision after Dorsal Incision.—In this case the same plan is followed of applying a ligature round the penis, band of anæsthesia and injection into the copora cavernosa penis, the final injections being made intradermally along the lines indicated in Figs. 4 and 5.

After-treatment.—In order to avoid unpleasant tingling when the parts are recovering sensation, the following draught should be given immediately after operation:—

℞ Liquor morphinæ hydrochlor. ♏ 30. Aq. ad ℥ss.

NASAL OBSTRUCTION IN INFANTS

DURING THE FIRST YEAR OF LIFE.[1]

BY J. ARNOLD JONES, O.B.E., M.B. MANC., F.R.C.S. EDIN.,

HON. SURGEON, ST. JOHN'S HOSPITAL FOR DISEASES OF THE EAR, MANCHESTER; HON. SURGEON, EAR, NOSE, AND THROAT DEPARTMENT, MANCHESTER CHILDREN'S HOSPITAL.

THE evil effects of nasal obstruction and the necessity for its efficient treatment in children and adults are now widely recognised, but concerning infants in the early months of their career there appears to be a consensus of lay and medical opinion that tender age prohibits efficient surgical treatment, and that a policy of *laissez faire* must be adopted until a more sturdy age is attained. That this policy is wrong I am firmly convinced, for to do nothing in the case of an infant suffering from severe nasal obstruction is to render its chances of reaching a really sturdy age somewhat remote, while surgical treatment is simple and efficient in the majority of cases.

[1] A communication read before the Manchester Medical Society.

Causes of Infantile Nasal Obstruction.

These may be set forth as follows:—

1. Congenital occlusion of the nostrils, (*a*) of the anterior nares, by means of a congenital web of skin at the junction of the vestibule with the nasal chamber proper, and (*b*) of the posterior nares, where a diaphragm consisting of bone, or partly of bone and partly of membrane, may partially or totally obstruct one or both choanæ. These conditions are rarely observed in the infant, for if the occlusion is complete, asphyxia neonatorum will result; if it is partial, it usually escapes attention until later years.

2. Temporary presence of mucous secretion in the nose, and engorgement of the nasal mucosa, during the first few days of life before mouth breathing is established. Hunter Tod records a case of this nature in an infant 12 hours old, who was threatened with death from asphyxia. He sprayed the nostrils with a weak solution of adrenalin hydrochloride, and free nasal breathing was at once established.

3. Congenital syphilis.

4. Mongolism. In mongols, the lumen of the nostrils is diminished, mainly due to depressed nasal bones.

5. Adenoids. This, by far the commonest cause of infantile nasal obstruction, is completely amenable to treatment.

Symptoms.

The symptoms of nasal obstruction in the infant are:—

(*a*) *Inability to suckle efficiently.*—Directly the mouth closes over the nipple difficulty of breathing through the obstructed nose at once occurs, and the infant has to let go the nipple in order to breathe through the mouth. It also swallows air whilst trying to suck, which makes it sick and gives it attacks of wind. Digestive troubles and malnutrition follow.

(*b*) *Snoring when asleep and frequent suffocative attacks.*—The mother complains that the infant has to fight for its breath and nearly chokes. Laryngeal spasm, laryngismus stridulus, and night sweats sometimes occur.

(*c*) *Persistent cough.*—This is reflex, or from spread of catarrh from naso-pharynx downwards.

(*d*) *Nasal discharge.*—Present in a certain proportion of cases, especially when the nasal obstruction is due to congenital syphilis.

(*e*) *Convulsions.*—A comparatively rare symptom.

(*f*) *Otorrhœa*, frequently bilateral, is observed in about 25 per cent. of cases when adenoids are the cause of the nasal obstruction.

Diagnosis.

Nasal obstruction is diagnosed from the presence of the above symptoms, (*a*) and (*b*) always being present in a greater or lesser degree. The question will then arise which of the five causes of nasal obstruction in the infant is operative.

Congenital occlusion of the nostrils is very rare, and only cases of partial occlusion survive. In these cases it might be noticed, as in the case recorded by StClair Thomson, that the mother could only nurse the child when it was lying on the obstructed side (so that the patent nostril did not get blocked by gravity). Examination with a probe will reveal the situation and completeness of the obstructing web. The presence of mucous secretion in the nostrils, and engorgement of the nasal mucosa, will cause temporary obstruction only, and this can be immediately relieved by the use of a weak adrenalin spray. In congenital syphilis there will be a muco-purulent, irritating nasal discharge, distinguished by its chronicity, as compared with a simple rhinitis. Typical skin eruptions and other constitutional signs of the disease are usually

present. The Wassermann reaction will be positive. A mongol is recognised by its typical appearance.

These four causes of infantile nasal obstruction having been excluded, adenoids may be confidently diagnosed. In the early months of life the post-nasal space is too small to allow of digital examination, so that actual confirmation is impossible.

Treatment.

Treatment varies with the cause. Congenital occlusion of the nostrils causing symptoms of nasal obstruction in the first year of life is extremely rare, so rare that I have never come across a single case, although I have seen a few in older children. Unless causing fairly urgent symptoms, surgical interference should be postponed until the increased size of the parts renders manipulations easier and more certain. The temporary presence of mucous secretion, and engorgement of the nasal mucosa, can be dealt with by the use of a weak adrenalin spray and thorough cleansing of the nostrils with an alkaline nose wash. Congenital syphilis is treated constitutionally in the usual way. In mongols operative measures are contra-indicated, as they exhibit a curious tendency to die under these circumstances, a fact first pointed out to me by Dr. C. P. Lapage.

Adenoids, which cause the great majority of cases of infantile nasal obstruction, should be surgically removed. It is my practice to operate on infants in the first year of life without an anæsthetic, which I consider to be unnecessary and inadvisable, thus the greatest risk is eliminated. The infant is placed on the table, the hands and body being held by a nurse, while an assistant steadies the head. A small Doyen's gag is inserted and the mouth opened. A specially small adenoid curette, of the StClair Thomson cage pattern, is then introduced and passed upwards into the post-nasal space behind the soft palate. A single firm sweep downwards will remove the adenoid pad. Meyer and Phelps have made two special sizes of curette to my order—the smaller one for infants a few weeks old, the larger for the others. There is but little bleeding, and I have never observed any shock. If possible, the operation should be arranged to take place about half an hour before a feed is due.

Results of Operation.

The results of this operation are excellent. It was in 1913 that I realised its value, but in that year and 1914 I can only find the records of four cases. Then came the war and a long absence from England on foreign service. In February, 1919, I resumed work at home, and since that date until the end of 1921 I have removed adenoids in 58 infants during the first year of life. Of these six have been under 1 month old, seven under 2 months, and seven under 3 months. Those cases done in 1919, 1920, and the first two months of 1921, totalling 23, I have recently investigated. One infant had died from an attack of bronchitis two months after operation. The rest were all cured of their symptoms, except in two cases in which slight nasal discharge still persisted. In both these cases, however, the nasal obstruction had been much improved. In six of these cases there had been a suppurative otitis media in one or both ears. In every case the ears were clean and dry.

A NOTE ON THE EFFECT OF BISMUTH ON THE KIDNEYS.

By H. B. DAY, *M.C.*, M.D., F.R.C.P. LOND.,
PROFESSOR OF CLINICAL MEDICINE, SCHOOL OF MEDICINE, CAIRO.

THE specific effects of arsenic and antimony on spirochætal and certain tropical infections have prompted several investigators to test the properties of the metal bismuth, since the latter occupies a close position in the periodic scale of the elements. Sazerac and Levaditi have recently published an account of their researches which demonstrated the curative action of this metal on rabbits infected by spirochætal disease and on human cases of syphilis.[1] Their observations have been confirmed and extended by the work of Fournier and Guenot.[2] On testing the relative merits of various compounds of bismuth, Sazerac and Levaditi selected the tartrobismuthate of sodium as the least toxic. For use in man this compound was prepared according to Cowly's[3] method and used as a 10 per cent. suspension in olive oil for intramuscular injection, the dose of the preparation being 2 to 3 c.cm. They established the important

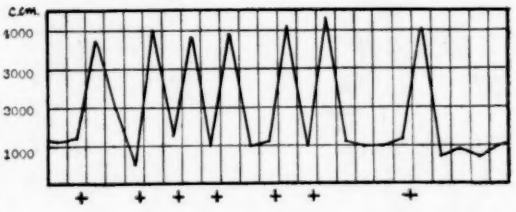


CHART 1.—Daily excretion of urine in c.cm. + indicates intravenous injection of 2 c.cm. bismuth compound.

fact that soluble compounds of bismuth are at least ten times as toxic when administered intravenously than when given by intramuscular injection. Subcutaneous injections are, in general, less safe than intramuscular injections. Thus in the rabbit a dose of 50 to 60 mg. per kg. body-weight had no toxic effect when given intramuscularly, but an intravenous injection of only 5 mg. per kg. was fatal.

This recent work has confirmed former observations that the characteristic sign of bismuth poisoning in mild degree is the development of a dark line on the gums, very similar to that of lead.[4] This may be associated with a gingivitis and in severe cases by a stomatitis, with discoloration and secondary infection by the organisms of Vincent's angina.

Personal Experience.

Before the above observations were published, I had begun work on the same subject and encountered certain toxic effects following the intravenous injection of bismuth, which are not mentioned in the articles quoted. The preparation I used was the liq. bismuthi et ammonii citratis (B.P.), which contains about 9 per cent. of bismuth citrate. This was prepared as aseptically as possible and sterilised by heating it in closed ampoules (each containing 2 c.cm.) at a temperature of 100° C. for over half an hour on three successive days. It may be mentioned here that Fournier and Guenot found this compound as efficacious as the tartrobismuthate in the treatment of syphilis, but that subcutaneous injections were liable to be followed by toxic effects.

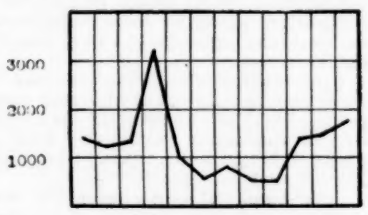


CHART 2.—+ Indicates intravenous injection of 2 c.cm. liq. bismuthi et ammon. cit.

Injections of 0·5 or 1 c.cm. had no general bad effect, but on repetition a black line formed on the gums with sometimes a stomatitis, the condition resembling a mixed effect of lead and of mercury. But intravenous injection, especially when the large dose of 2 c.cm. was given, gave rise to signs of poisoning. There were nausea or actual vomiting and slight diarrhœa in most patients. But the most striking result was a copious diuresis, unaccompanied by strangury or other signs of vesical irritation.

[1] Sazerac and Levaditi: Annales de l'Institut Pasteur, January, 1922. [2] Fournier and Guenot: Ibid.
[3] Cowly: Chemist and Druggist, 1913, vol. lxxxii., p. 212.
[4] THE LANCET, 1913, ii., 1039.

Chart 1 illustrates the effect on the urinary excretion in the case of a vigorous patient admitted for ascites due to hepatic cirrhosis (non-syphilitic). He exhibited a remarkable tolerance for the drug, which caused no gastro-intestinal symptoms, and even begged for more intravenous injections, as the diuresis induced kept his ascites in check. It will be seen that the usual daily excretion of urine was 1000 c.cm. and that each injection of bismuth increased the day's output fourfold. There was no albuminuria, but a black line formed in the gums, with some gingivitis, which quickly subsided under treatment.

In two older patients a single intravenous injection of 2 c.cm. was followed by signs of renal injury, very slight and transient in one case, but definite in the other (see Chart 2). This latter patient, aged 54, developed an acute tubular nephritis. On the fourth day the urine showed a heavy deposit of casts—chiefly epithelial—without blood corpuscles and but very few leucocytes, while albumin was present to the extent of 3 parts per 1000 (Esbach). After this date the condition rapidly improved, and by the tenth day there was the merest trace of albumin with a few hyaline and granular casts. At no time did any œdema appear.

The action of bismuth was further tried on two cases of actual nephritis. In order to minimise toxic effects if possible, two small subcutaneous doses were first given in the hope that tolerance might be gained as with antimony. A larger dose (1·5 c.cm.) was injected intravenously after a few days, no harm having resulted from the preliminary injections. In one patient, a case of acute nephritis associated with chronic bacillary dysentery, a definite diuresis lasting some days followed immediately on the intravenous injection, and his condition improved; in the other patient, a case of chronic nephritis, no change either for better or worse was observed.

To determine whether the citrate component of the drug used was responsible for the diuresis produced, several patients were given an equivalent amount of pot. citrate by intravenous injection. This had a distinct but far less diuretic effect than that induced by the bismuth compound.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

LABOUR OBSTRUCTED BY A SOLID CARCINOMATOUS TUMOUR OF THE LEFT OVARY.

CÆSAREAN HYSTERECTOMY WITH REMOVAL OF TUMOUR.[1]

BY S. GORDON LUKER, M.D. CAMB., F.R.C.S. EDIN.,
ASSISTANT OBSTETRIC SURGEON TO THE LONDON HOSPITAL.

IN the following case the uterus and left appendages were removed by operation during labour. Before removal the ovarian tumour was in Douglas's pouch, pushed down into the pelvis by the fœtal head, thus forming an insuperable obstacle to delivery. In the fresh state the tumour measured 19 by 9 by 4·5 cm., the surface was smooth; on section it was dull white and whorled in appearance. Towards the centre it appeared degenerate and yellow with some extravasated blood: it was free from attachment to other organs and there was no evidence of any other disease in the pelvis. The right ovary appeared healthy.

The clinical history of the case was as follows: The patient, a primigravida, aged 40, was admitted to the London Hospital on April 24th, 1922, having been in labour 14 hours. She had been attended by a doctor, who had applied forceps unsuccessfully before sending her up to hospital.

[1] An account read at the Section of Obstetrics and Gynæcology, Royal Society of Medicine, on June 1st, 1922.

Examination after admission showed a quite good general condition; the fœtus was alive, the fœtal head engaged; the external measurements of the pelvis were normal. From her dates the patient was 15 days over full time. On vaginal examination the os uteri was three-quarters dilated and torn. Posteriorly the examining finger felt a large, hard rounded lump behind and outside the uterus, pressed down into the pelvis by the fœtal head. The pains were strong and frequent. Diagnosis of the lump rested between an ovarian tumour or a fibroid in the lower uterine segment; the latter seemed rather more probable.

Cæsarean section was decided upon for the following reasons: Firstly, the fœtus was post mature and large, the fœtal heart was becoming more rapid, the patient was over 40; therefore, Cæsarean section afforded the only real chance of delivery of a living child. In the event of the child being alive it was decided to do hysterectomy because the uterus was most probably infected; the membranes had been ruptured nine hours, and forceps had been applied under unfavourable conditions.

Laparotomy was therefore performed and the uterus was packed off from the peritoneal cavity. The infant was extracted by the ordinary uterine incision, and the uterus, left tube, and left solid ovarian tumour were removed in the ordinary way. A small portion of the cervix of the uterus was preserved. The child was a well-developed female weighing 8 lb. 10 oz. The patient made an uninterrupted recovery, the temperature and pulse-rate settling after two days.

Histological examination of the tumour showed it to be a solid polygonal-celled scirrhous carcinoma of the ovary.

On thinking over this case I am aware that my treatment will not be accepted as orthodox in two points: (1) The performance of Cæsarean section for obstruction by an ovarian tumour; and (2) the necessity for hysterectomy after Cæsarean section owing to the danger of sepsis.

On the first point, I have mentioned above that the reasons I decided upon Cæsarean section were that the patient was over 40, and a primigravida who had already been in labour with membranes ruptured for some hours. As the fœtus was large it seemed quite likely that, if the ovarian tumour could be removed by laparotomy, natural labour might go on for quite a long time before delivery of the child could be effected. In other words, the chance of a living child was bad except by Cæsarean section.

On the second point, I am, in general, opposed to hysterectomy after Cæsarean section in a suspect septic case. I have found it impossible to determine practically by bacteriological methods whether or not the liquor amnii is seriously infected. I am therefore guided by the condition of the patient, the length of the labour, the length of time the membranes have been ruptured, and the extent and nature of manipulations and the conditions under which they were carried out. In this case I decided that it was too dangerous to leave the uterus.

The carcinomatous nature of the ovarian tumour might be considered an additional indication for hysterectomy. Yet I feel that in similar cases in younger women, apart from sepsis, I would be prepared to leave the uterus and keep the patient under observation.

TRAUMA AS A CAUSE OF CHRONIC GASTRIC ULCER.

BY H. E. GRIFFITHS, M.S. LOND., F.R.C.S. ENG.,
CHIEF ASSISTANT TO A SURGICAL UNIT, ST. BARTHOLOMEW'S HOSPITAL, LONDON; SURGEON TO ALBERT DOCK HOSPITAL.

THE case here recorded is one of innocent gastric ulcer in which trauma seems to have played an important part as a causative factor.

A labourer, aged 58, was unloading brick dust on Nov. 23rd, 1921, when he was struck in the epigastrium by the handle of a spade used by one of the other men working with him. He was brought into the Albert Dock Hospital, collapsed and vomiting blood-stained material, and was admitted under the care of Dr. F. H. Lowe, who treated him for gastric ulcer. Later I was asked to see him with a view to operative treatment. As a result of the patient's anæmia, secondary to hæmorrhage, I did not think it wise to operate until Jan. 11th, when I did an exploratory laparotomy. An ulcer about a quarter of an inch in diameter was found on the anterior aspect of the stomach near the pylorus and the lesser

curvature. There were no adhesions to the stomach and the walls of the ulcer were only slightly indurated. Unfortunately at this juncture difficulties were experienced with the anæsthetic and the patient stopped breathing. Artificial respiration was resorted to for 20 minutes before the patient recovered. Further interference with the abdominal contents was deemed inadvisable; the wound was closed and the patient was returned to bed. He refused a further operation and was discharged from hospital at the end of January. In the beginning of March he had a recurrence of hæmatemesis and was readmitted to hospital. On April 10th a second operation was performed; the stomach was now found to have several adhesions to the anterior abdominal wall and one to the liver. These were broken down or divided and the stomach examined. The ulcer was found to be slightly larger than when previously seen and the stomach wall in its neighbourhood indurated over a greater area. There were no enlarged lymph glands felt in the gastro-hepatic omentum or great omentum. Posterior gastro-jejunostomy was performed and the vestibule of the stomach and the pylorus excised. The abdominal wound was closed and the patient returned to bed. The patient made an uneventful recovery. A section of the ulcer was cut and a microscopic examination showed no evidence of malignancy. The specimen is preserved in the museum at St. Bartholomew's Hospital.

The patient stated that he had only suffered from indigestion for one short period, about four years before his entry to hospital. When first examined I thought his condition was in all probability due to hæmorrhage from a chronic gastric ulcer which in some way had been injured at the time of the accident, but in view of the fact that at the first operation, six weeks after the original accident, there were no adhesions in the region of the ulcer and there was little induration of the surrounding tissue; whereas, at the second operation, three months later, there were several adhesions in the neighbourhood of the ulcer which had increased in size and its margins become much more indurated, it seems to me likely that when first seen the ulcer was in a comparatively acute stage, and in all probability was started at or about the time of the accident.

A CASE OF PNEUMOTHORAX FOLLOWING BREATHING EXERCISES.

BY JAMES CROCKET, M.D., M.R.C.P.EDIN., D.P.H.,
LECTURER ON TUBERCULOSIS, GLASGOW UNIVERSITY; MED. SUPT., CONSUMPTION SANATORIA OF SCOTLAND, BRIDGE OF WEIR.

THE following case of spontaneous pneumothorax following breathing exercises may be of interest.

On April 8th of this year a patient was referred to me by Dr. J. H. Paul, of Millport, suffering from breathlessness and pain in the right chest. Examination of the thorax showed immobility and distension of the right side of the chest. The percussion note was hyper-resonant. In the infra-scapular and lower axillary area amphoric breathing was elicited. Elsewhere there was an absence of any respiratory murmur. No metallic tinkling was heard. His temperature was normal and the pulse-rate 90 per minute. An X ray examination of the chest showed the lung to be completely compressed against the lower mediastinum, and there was a band of adhesions stretching from this to the axillary area. The diagnosis of pneumothorax was obvious. The patient stated that previous to the onset of this condition he had never felt better in his life. He was interested in athletics, and when unable to indulge in sport went through breathing exercises once a week. A week before I saw him, after going through those exercises, he felt a sharp pain in the chest and became breathless. After breakfast he was much better and went off on his motor-cycle for a run from Glasgow to Largs—a distance of approximately 45 miles. At Largs he felt so ill that he had to be taken back to Glasgow in a motor-car. No history could be elicited definitely indicative of previous lung disease. He stated that while in the army he had had a bad time with "gastric fever," but except for that, according to his history, his record was clear. The pleuritic adhesion seen in the radiogram indicated that there nevertheless may have been an active tuberculous lesion of the lung at some remote period previously.

I have seen the patient since, and he is apparently progressing satisfactorily. Although the lung is not expanding rapidly his temperature remains normal, his pulse has improved, and he has now no difficulty with his breathing. The case demonstrates the danger of violent respiratory exercises even in apparently healthy individuals.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

NAVAL, MILITARY, AND AIR FORCE GROUP.

Laboratory Meeting.

A GENERAL meeting of this group was held at the Royal Army Medical College, London, on July 21st, Surgeon Rear-Admiral Sir PERCY BASSETT-SMITH being in the chair. The chairman pointed out the value of the group as a means of union between the various public health services and the assistance that meetings of this sort afforded to practical coöperation. Demonstrations in the hygiene and pathology laboratories of the College were given under the auspices of Lieut.-Colonel J. ANDERSON, Professor of Hygiene, and Lieut.-Colonel MARIAN PERRY, Professor of Pathology.

Hygiene.—The storage of bleaching powder for water sterilisation in hot climates has always presented difficulties. A series of exhibits were shown illustrative of a solution of this problem. The deterioration of bleaching powder in tropical countries is due to the interaction of the bleach and its absorbed water under the influence of heat; it has been found that it is practically impossible to obtain an anhydrous bleach on a commercial scale. The difficulty has been overcome by adding 20 per cent. of quicklime, and it has been found that tins of this bleach and quicklime mixture, after several months of storage in the tropics, show very little fall in the available chlorine content.—Another exhibit dealt with the equipment problem: the measurement of energy expenditure by indirect calorimetry was demonstrated by Major LOTHIAN, also the various problems connected with equipment and the load of the soldier.—An interesting demonstration on motion study and its practical value was given in connexion with a recent research carried out at the School of Military Engineering, Chatham, on trench digging. The cyclographic method of studying motion was shown, also a complete set of cyclographic and slow-motion photographs.

Pathological.—Living specimens of *Bullinus contortus* and *Planorbis boissyii*—intermediate hosts of the bilharzia parasites—were demonstrated, showing all stages of development from the egg upwards.—Lantern demonstrations showed the striking results of vaccine prophylaxis upon the incidence of typhoid and paratyphoid fevers during the late war. A demonstration was also given of the method of preparation of "T.A.B." vaccine.—Specimens were shown illustrative of the intestinal lesions which may occur in visceral leishmaniasis.—Modern diagnostic methods in the various infective intestinal diseases were shown in considerable detail. Exhibits were also shown dealing with the ætiology and prophylaxis of various tropical diseases, such as plague, malaria, and bilharziasis. These specimens afforded convincing evidence of recent advances made in bacteriological and protozoological technique.

The venereal section was divided into three parts: prevention, diagnosis, and cure. Preventive packets from British and foreign armies were shown, with a suggested simplified outfit. The various organisms were demonstrated, either under dark-ground illumination or as stained slides. The Wassermann test for blood serum and cerebro-spinal fluid, mastic test, and various chemical tests completed the diagnostic part. Various instruments used in the treatment of urethral gonorrhœa were shown, also an exhibit dealing with the value of flavine dyes in the treatment of gonorrhœa, both intravenously and by the subcutaneous route.—The use of an adsorbed gonococcal vaccine in treatment and of sulpharsenol in small doses to cut short complications illustrated new methods in the cure of this intractable disease.

Reviews and Notices of Books.

PROTEIN THERAPY AND NON-SPECIFIC RESISTANCE.

By WILLIAM F. PETERSEN, M.D., Associate in Pathology, University of Illinois. New York: The Macmillan Company. 1922. Pp. 314. 21*s*.

IT is no easy task to give an adequate idea of a book containing over 300 pages of closely packed information, with large numbers of records of laboratory experiments and 50 pages of references; and when the work centres round the protein molecule with all its intricacies the task is made even more difficult. The amount of material available for the study of this subject is obviously very large and the assimilation of it is still far from satisfactory, clinicians and bacteriologists being somewhat at cross purposes both as to facts and their interpretation. The clinician, justifiably enough, seeks results; the bacteriologist seeks causes and the mechanisms of action, and, moreover, if he be a careful worker, is haunted by the fear of "controls," which have a bad habit of spoiling very pretty conclusions. The correct assessment of the value of the work from these two points of view is nowhere more difficult than in the field of inoculation therapy, and the writer of this book has set himself no small task in bringing together all that is known on the subject of protein therapy.

Perhaps the scope of the book can best be realised from a remark in the author's preface that protein therapy deals merely with one of a large number of agents which can be used to elicit the non-specific reaction. Other terms have also been applied—"colloid therapy," "shock therapy," "foreign protein therapy," "hetero-vaccine therapy"; and the earlier chapters of the book deal with most of these seriatim—cautery, seton, fontanelle, blister, rubefacient, as well as the more generally recognised non-specific agents, such as serums, enzymes, vaccines, and colloidal metals.

The book is divided into three main portions, first the method of non-specific protein therapy, secondly the theories regarding it, and thirdly the clinical results. To us the second portion has proved to be by far the most interesting. Here the author has devoted three chapters to the theories concerning the mechanism of the reaction, the probable mechanism of the reaction, and the relation of the skin to non-specific resistance. Starting out from the standpoint of Weichardt's theory of omnicellular plasma-activation, Dr. Petersen makes several points which compel close attention. Stimulation of cell metabolism is a general rather than a local process, and to the author it involves no alteration in function. The body acquires no new method of defence through non-specific protein activation, but the stimulation represents a cumulative effort of the defensive agencies of all the organs, and, as a necessary corollary, cell stimulation must be closely bound up with cell fatigue. This proposition is set forth diagrammatically, in its simplest terms, on p. 88. Unfortunately, little is said on the question of sensitisation, though it is pointed out that detoxication can take place in the direction of synthesis as well as in the further lysis of the protein complexes. This whole question of detoxication is in great need of further elucidation, in relation to the cleavage of the protein molecule. How far, for example, may the protein molecule be split up before it ceases to be of any value as a therapeutic agent? In the chapter on the probable mechanism of the reaction, the discussion on the immunological processes in pneumonia will interest many readers, especially the sections dealing with the relation of the clinical crisis to the presence of proteolytic ferments. The author shows that apart from the intoxication arising directly from and incident to the growth of the pneumococcus, toxic split products are absorbed from the exudate, which can indeed be considered as a mass of foreign protein undergoing slow digestion before the crisis. Active autolysis once under way, only the lower and non-toxic split products will be absorbed, and the environments for the further proliferation of the pneumococcus will become unfavourable as shown by the increase of hydrogen-ion concentration. Proteolytic enzymes from the disintegrating leucocytes are liberated, and have been demonstrated by Dr. Petersen and others in the serum of patients. The curves shown of these ferment titres placed alongside the temperature charts are extremely interesting. The work concludes with a short appendix on the proteins and their split products.

We believe that many workers in the vast field of research which relates to protein metabolism in health and disease will be glad to possess this book. It is one to keep upon a shelf for reference, and to add to that valuable collection of immunological text-books which American workers have given us of late years.

ENDOCRINE THERAPEUTICS.

By THOMAS BODLEY SCOTT. London: H. K. Lewis and Co., Ltd. 1922. Pp. 118. 5*s*.

READERS of Dr. Bodley Scott's book on "Modern Medicine and Some Modern Remedies," published in 1919, will welcome another volume by the same author. Dr. Scott writes with charm and with personal conviction, and the reader will find both pleasure and profit in this little volume, wherein there lies a message of hope for those past middle age who are beginning to feel the burden of years. Dr. Scott invites them to investigate their endocrine deficiencies and by correcting them to make old age a period of joy and usefulness. He was one of the first advocates in this country of the use of thyroid extract in threatening eclampsia, and of the value of anterior pituitary in high tension. In all he writes Dr. Scott brings to bear a wide and personal experience, and those who accept him as their guide in endocrinology will be on safe ground.

NERVOUS AND MENTAL DISEASES.

Edited by PETER BASSOE, M.D., Associate Professor of Nervous and Mental Diseases, Rush Medical College, Chicago. (Vol. VIII. of the Practical Medicine Series on the Year's Progress in Medicine and Surgery.) Chicago: The Year Book Publishers. 1921. Pp. 249. $1.75.

WE have frequently taken occasion to recommend to the practitioner the volumes of the yearly Practical Medicine Series, which resemble the well-known Medical Annual published in England by Messrs. Wright, and have the advantage that the arrangement in several volumes enables those interested in special subjects to buy only the parts they desire. The present issue is replete with useful summaries of the year's literature in neurology and mental disease, and there is a section on the ductless glands. It is fully as valuable to the neurologist, in fact, as to the general medical reader.

MEDICAL PROOF OF THE MIRACULOUS.

A Clinical Study. By E. LE BEC, Hon. Surgeon to St. Joseph's Hospital, Paris; President of the Bureau des Constations, Lourdes. Translated from the French by Dom. H. E. IZARD, O.S.B., L.R.C.P., M.R.C.S. With an Introduction by ERNEST E. WARE, M.D., M.R.C.S., Senior Surgeon, Hospital of SS. John and Elizabeth, London. London: Harding and More. 1922. Pp. 198. 6*s*.

THE attitude of mind of the author and the general "atmosphere" of his volume are such as to appeal to certain circles only; those who are in sympathy with the object will naturally find herein all that they wish to substantiate Mr. le Bec's contention—viz., that the "cures" recorded are due to the intervention of a "supernatural force." On the other hand, the writer of the introduction admits frankly that the clinical details are often sparse and that evidence before a "cure" is frequently given by witnesses who hold no surgical qualification, and shelter is taken behind the argument that, after all, "scientific

testimony is proximate." Thus the legitimate objections of the sceptic are at least recognised, but they are not met. In these circumstances we do not see how any good purpose would be served in subjecting the cases selected to detailed examination on the evidence given, for the simple reason that this is not medically and scientifically speaking sufficient. A single example may be taken by way of illustration. The history is given of a patient with, at different times, the symptoms of phthisis, Pott's disease, tuberculous hip disease, tuberculous peritonitis, and tuberculous meningitis. As a sequel to immersion in the piscina at Lourdes, "complete freedom of movement" of spine and hip-joint returned, and no other result is specified. Yet in the summary of the case a few lines further on, we read as follows; "Tubercle had attacked the lungs, the lymphatic glands, the vertebral column, the peritoneum, and the brain. And all this disappeared suddenly in the bath at Lourdes." This type of argumentation needs no comment.

SYSTEM DER NEUROSE.

By Dr. EMIL KUGLER. Berlin and Vienna: Urban and Schwarzenberg. 1922. Pp. 188. M.84.

A CAREFUL and painstaking examination of some 2000 cases of "neurosis," derived from the different strata of disease provided by hospital, private, and sanatorium practice, is bound to be of clinical and documentary interest, even though it may not furnish data of especial theoretical importance. We are glad to introduce Dr. Kugler's study to the English reader, for a general review of this description and size is not often attempted. It is not, perhaps, absolutely essential to have a precise definition of "neurosis" to investigate "neurotic" symptoms.

The author's division of neuroses is as follows: (1) hysteria; (2) depressive; (3) hypochondria; (4) anxiety; (5) vasomotor and sympathetic; and (6) fatigue. His ætiological classification is twofold—viz., somatic and psychical. Included in the former are those neurotic states derived from anæmia, malnutrition, toxæmia, digestive disorder, circulatory impairment, and so on; in the latter, overwork, sexual trouble, the climacteric, occupation, trauma, and errors of education are among the factors whose action is illustrated by clinical description. Useful bibliographies accompany each chapter. It is naturally difficult to separate ætiological agents in any exact fashion, and the author's percentages are doubtless liable to criticism from failure to take this fully into account; but they provide interesting comparisons, and schematisation of knowledge in this respect has its place. The correlation of somatic cause and psychical effect, as attempted by the author, is also praiseworthy, if to some extent indeterminate; but the book would gain in value by a more serious attempt to decide what constitutes a "neurotic" symptom, and wherein "functional" signs may be said to be distinguishable from "organic" signs.

THE PRACTICE OF AUTO-SUGGESTION

By the Method of Emile Coué. By C. HARRY BROOKS. With a Foreword by Mr. Coué. London: George Allen and Unwin. 1922. Pp. 124. 3*s* 6*d*.

IN a few simply and pleasantly expressed chapters Mr. Brooks, who has studied at Nancy the methods associated with the name of M. Coué, supplies something of the theory and a good deal of the practice of auto-suggestion. His obvious enthusiasm is not unduly bridled with any recognition of the limits of the technique, which "should be utilised for every ailment, whatever its nature, and whether its inroads be grave or slight." This is the less surprising, however, as we read that auto-suggestion is "primarily a means of self-culture," and, one may suppose, therefore of universal applicability both in health and in disease. The desire for betterment, for self-improvement, for self-realisation, shared by all normally-constituted human beings, can be attained through auto-suggestion, by taking a piece of string, tying in it 20 knots, and repeating 20 times, when comfortably installed in bed, the general formula familiar to our readers. In other words, auto-suggestion is a new religion. Mr. Brooks feels that the affirmation contained in M. Coué's formula is "a kind of prayer." There were brave men before Agamemnon and suggestionists before M. Coué, nor is the useful place in therapeutics of simple suggestion likely to be denied; but if auto-suggestion is claimed to furnish the dynamic for the attainment of the secret yearning and longing of the human soul, some will prefer the method of one who also spoke with authority, but nearly two thousand years ago.

STUDENT'S GUIDE TO VACCINATION.

By W. G. AITCHISON ROBERTSON, M.D., D.Sc., F.R.C.P.E., late Teacher of Vaccination and Lecturer on Medical Jurisprudence and Public Health, Surgeons' Hall, Edinburgh. London: A. and C. Black. 1922. Pp. 84. 3*s*. 6*d*.

Dr. Robertson's little volume is almost all that is required by the medical student in the way of facts and statistics to substantiate his own belief in the protective value of vaccination and to enable him to assist in the rout of its opponents. As to technique, chapters on the examination of the child, the preparation of the part, the instruments, &c., are clearly and practically written. Those chapters dealing with symptoms and progress are excellent, and whilst a short account on "arm-to-arm vaccination" is given for those whose lot may be cast in out-of-the-way places, the author advises that this method, if possible, should be avoided. In his reference to the preparation of lymph, the author omits to mention that it has 0·1 per cent. oil of cloves added to it, and that it is stored at a very low temperature (10° F.). Adverting to the thorny subject of aerial convection of small-pox, the author rightly refers to personal intercourse as being a potent factor. No reference is made to the occurrence of concurrent variola and vaccinia, a subject of some interest and importance.

We can cordially recommend this book to the medical student, and others interested in the subject, as a concise and excellent guide to vaccination problems.

LOCAL ANÆSTHESIA IN DENTAL SURGERY.

Second edition. By NORMAN BLACK, L.D.S., Lecturer in Dental Surgery and Pathology, Dundee Dental School, University of St. Andrews; Hon. Dental Surgeon, Dundee Dental Hospital. London: Bale, Sons and Danielsson. 1922. Pp. 79. 5*s*.

LOCAL anæsthesia now plays an important part in dentistry and it is necessary that every dentist should have a sound knowledge of the principles on which it is based. Used with strict precautions against infection and with due regard to its limitations, local anæsthesia has a wide field of usefulness and has placed a method of great potency in the hands of the dentist. Where it is used empirically, it may be and often is productive of much harm. A sound knowledge of the anatomy of the fifth nerve and of the pharmacology of the various drugs employed is necessary if a rational conception of local anæsthesia is to be attained.

Mr. Black has been successful in compressing all the essentials of this subject within small compass, and both student and practitioner will find his little book reliable and lucid. The book is rather too obviously based on a series of lectures; the style is somewhat colloquial for the written page. Mr. Black shows a definite bias in favour of cocaine and states that he has himself used it in many thousands of cases without untoward results. However, he puts the case for other drugs fairly, and on the arguments offered the reader is quite likely to decide in favour of novocain on the grounds of its safety. With this view we should agree, for the toxicity of cocaine and the fact that it cannot be boiled make it an undesirable drug for use in dentistry. Mr.

Black advocates the addition of iodine or chloretone to the cocaine solution in order to keep it sterile. He admits that the method is not certain and, moreover, carries with it the disadvantage that the different preservatives are also injected into the tissues. If novocain be used in tablet form, a fresh sterile solution can be made *de novo* for each patient, a much safer procedure. For sterilising the syringe, Mr. Black does not advise boiling and recommends keeping the syringe in some antiseptic solution. However, provided an all-metal or glass syringe be used, it can be boiled without damage and this is undoubtedly the ideal procedure. Mr. Black states that the nature of the antiseptic solution should vary with the anæsthetic employed; if cocaine is used, he advises a strong solution of lysol. If novocain or apothesin is used, lysol is contra-indicated since these are decomposed by the slighest trace of free alkali. Surely the same argument applies to cocaine which is equally precipitated by alkalis. The chapter on block anæsthesia is extremely good and the account of the anatomy of the fifth nerve concise and accurate.

Altogether the book reaches a high standard of excellence and may be cordially recommended.

STERILITY AND CONCEPTION.

By CHARLES GARDINER CHILD, Jun., M.D., Professor of Gynæcology, New York Polyclinic Medical School and Hospital, &c. London and New York: D. Appleton and Co. 1922. Pp. 222. 21*s*.

THE author points out in his preface that there is at the present time in the United States a higher rate of sterility and a lower rate of fertility among the native-born women than in any other civilised nation, the estimated rate of fertility being for all classes between 20 and 25 per cent., while the number of those absolutely sterile is about 12 per cent. While there has been a decrease in fertility in almost every civilised country in which records are available, in the United States the rate of sterility is estimated to have mounted from 2 to over 20 per cent. in one century. The need for a careful review of the conditions which have helped to bring about this state of affairs is great; it is complicated by the fact that the prevention of conception is a practice very common among civilised people at the present day, and has led to the establishment of "birth control" societies holding public meetings and publishing official organs for the wide dissemination of their propaganda. In view of the widespread practice of birth control at the present day it is important that all the possible causes of involuntary sterility should be carefully studied with a view to their prevention or treatment. Unhappily this is only too often where medical knowledge fails, and not only in many cases is it impossible to make a certain diagnosis of the causative conditions but, even when they are known, treatment is very often ineffective.

The author has done well in collecting under one cover the facts with regard to our knowledge of sterility and conception, and those who have to deal with cases will find much valuable information in this monograph. After considering the subjects of reproduction and the growth of the fertilised cell the author discusses the ætiology and diagnosis of sterility, and then passes in review the various gynæcological affections which may be its cause. He does not forget the importance of the thorough examination of the male partner, and calls attention to the fact that the woman is only too often improperly blamed and treated without first carefully eliminating any failure on the part of the man. Chapters are devoted to consideration of both therapeutic and criminal abortion, and the operative technique of those measures which may have to be undertaken for the relief of the varying conditions which may procure abortion is fully described.

The book contains a great deal of useful information.

BRITISH MEDICAL ASSOCIATION:
ANNUAL MEETING AT GLASGOW.

SECTION OF MEDICINE.

WEDNESDAY, JULY 26TH.

THE first session of this section was devoted to a discussion, under the Presidency of Prof. T. K. MONRO (Glasgow), on the

Prognosis and Treatment of Chronic Renal Disease.

Prof. HUGH MCLEAN (London), who opened the discussion, dealt chiefly with the modern laboratory tests for renal disease, which he considered ought to be employed even in the mildest cases, as they gave a more accurate idea of the patient's condition than did clinical symptoms. In the estimation of urea in the blood it was essential that certain factors should be considered. If the patient was taking the normal amount of food the blood-urea should range from 15 mg. to 40 mg. per 100 c.cm. These figures applied only to young or middle-aged persons. In old people it was not uncommon to get an amount of 50 to 60 mg. of urea per 100 c.cm. of blood as an ordinary senile change. That point was of importance in view of the possibility of operation, which one would hesitate to recommend when the blood urea was over 60 mg. A high amount of blood urea and at the same time a low amount of urea in the urine was a good prognostic sign. The urea-concentration test would show defects in the kidney when the blood-urea showed nothing. After the administration of 15 g. of urea young subjects would pass 3 per cent. of urea in the urine. The condition was not bad when 2 per cent. of urea was passed, but in severe cases they might pass only 1 per cent. He regarded the diastasic test as useful only when combined with other tests, and thought that the most valuable information could be gained from the estimation of blood-urea and the urea-concentration test. With regard to the cardio-vascular system, it was the general opinion that chronic renal disease was accompanied by marked cardio-vascular disease. But in his experience it was frequent to get marked cardio-vascular symptoms with very slight renal changes, and on the other hand uræmic symptoms were often due to vascular disease when the renal condition was quite good. With regard to the prognosis in surgical cases, these various tests gave excellent guidance; at St. Thomas's Hospital they had had no deaths from uræmia after operation since the routine adoption of the tests.

Treatment resolved itself into the empirical treatment of symptoms. In the chronic interstitial type it had been the custom to allow as little food as possible, and especially to limit the proteins, but there was no real evidence to show that harm resulted from proteins in the diet, or that uræmic manifestations were affected by a low protein diet. However, in the present state of knowledge it was better to limit the proteins in bad cases, but in cases of moderate severity that treatment was too drastic, and in mild cases an ordinary mixed diet including proteins should be ordered. In hydræmic cases there was practically always a great loss of proteins by the urine, and one of the best methods of getting rid of the urea was by giving a large protein diet. It was also a good plan to administer 20 g. of urea per diem. In certain cases decapsulation of the kidneys was a useful measure.

Dr. J. D. COMRIE (Edinburgh) agreed with Prof. McLean as to the value of tests. In the old method of testing for albumin in the urine, the finding of albumin on one occasion was of no value, but if found on several occasions it gave a valuable indication of the patient's progress. The relation of the amount of urine passed during the day and night was important. In chronic nephritis as much urine was usually passed during the night as in the daytime. Blood-urea was increased in certain diseases, such as fever and pneumonia, but not necessarily in cases of hydræmic nephritis, and this was very important from the surgical point of view. If the urea in the

blood was found to be over 50 g. per 100 c.cm. the patient should be put on a very low protein diet, but if the blood-urea was not raised the patient should be allowed an extra amount of protein food. In testing for urea concentration due allowance was not always made for the diuresis produced by the administration of urea, and Dr. Comrie suggested a formula to provide for this allowance. He had used for years the phenol-sulphophthalein excretion test which, in his opinion, was very valuable. The normal excretion in this test was 70 per cent.; if a patient passed 50 per cent. when under treatment the prognosis was good, but very unfavourable when the amount passed was under 20 per cent.

Dr. J. O. SYMES (Bristol) said that the text-books described chronic parenchymatous nephritis as the most deadly form of the disease, in which death took place in from 3 to 12 months. Did such a condition actually exist? There was really no clinical entity of tubular nephritis; the condition was only a stage of diffuse nephritis, and the prognosis was not so serious as they had been led to believe in the past. He had for some time observed at Bristol 52 cases of chronic renal disease, of which only two had been diagnosed as chronic parenchymatous nephritis. Nephritis was a vascular disease, and the glomeruli were affected as well as the tubules. As to treatment, he was greatly impressed by the value of the administration of urea by the mouth, and quoted cases illustrating its efficacy. His cases of œdema were not kept in bed and they were given an ordinary hospital diet. As nephritis paralysed the blood-forming organs, he also thought it important to administer arsenic and iron.

Prof. J. SHAW DUNN (Birmingham) dealt with the pathological aspect of the disease, distinguishing the changes which occurred into two main types. In the first type there was alteration of structure, the glomeruli were not much affected, and the tubules showed degeneration, but not destruction. In that type hydræmic symptoms predominated, but there was little tendency to retention of urea or uræmia, as the glomeruli were still active. In the second type there was interstitial sclerosis of the glomeruli, a large number of which were totally destroyed. There was in extreme cases destruction and almost total disappearance of more than half of the tubular tissue, and there were not enough glomeruli to excrete the necessary amount of urea.

Dr. KATHERINE ROBERTSON (Glasgow) gave particulars of several cases of renal disease which had been under her care.

Dr. O. L. V. S. DE WESSELOW (London) drew attention to the importance of other bodies excreted by the kidney, besides urea, and referred to the work of American observers on uric acid and kreatinin. One of the earliest signs of nephritis was retention of uric acid, and the excretion of kreatinin was regarded as a serious symptom. He thought the test for the retention of the inorganic phosphates of the plasma was a valuable one. In a normal individual the average amount of inorganic phosphate was 2–4 mg. per 100 c.cm. of blood. He had found in 30 cases of nephritis a definite rise of phosphate content of the blood, up to 6 or 7 mg. per 100 c.cm., and in three patients, all of whom died, the amount exceeded 10 mg. The toxic agent in uræmia was still to seek; urea by itself had no real toxic effects, as patients with an extremely high amount of blood-urea were still able to get about, but the presence of phosphates and kreatinin in the blood was of serious prognostic import.

Dr. H. L. TIDY (London) expressed surprise that there had been no mention of the "small white kidney" in the discussion. In his opinion it was not possible to fit all forms of chronic nephritis into two main types; three or four types at least must be recognised.

Dr. E. J. TOYE (Bideford) said that he had adopted these tests in his practice with excellent results, and thought that they were quite within the compass of a general practitioner willing to take a little trouble.

The PRESIDENT said that while recognising the value of laboratory tests, the older methods of examination should not be neglected. One advantage of the tests was the provision of a record for reference. He would like to find a test that would show when the kidneys were damaged without being actually destroyed.

Prof. MCLEAN, in reply, reiterated his belief that all forms of chronic renal disease were but stages of one disease, the two main types of which, the hydræmic type and the interstitial type, were distinguishable by their main symptoms and by the application of the laboratory tests described.

THURSDAY, JULY 27TH.

At this session the chair was taken by Dr. C. O. HAWTHORNE (London). Prof. GEORGE R. MURRAY (Manchester) opened a discussion on

Exophthalmic Goitre.

He said that he proposed to consider what was known of the causation of the disease, in the attempt to discover what measures could be taken to prevent its onset or to check its development in the early stages. At the annual meeting of the Association in 1896 he had reviewed the current views of the day that in exophthalmic goitre there was an excessive formation and absorption of thyroid secretion, which might or might not be normal in character, and that the symptoms were due to the presence of this excess of secretion in the blood and to its action upon the tissues and especially upon the nerve centres in the medulla. In essentials that view was still generally accepted; and it was found that when, as the result of treatment or spontaneous atrophy, the secretion was reduced to normal amounts, recovery took place. That was a strong indication that the thyroid alone of the endocrine glands was primarily at fault in this disease. The exophthalmos was attributed either to vascular engorgement, to muscular action, or to excess of orbital fat. Vascular engorgement, in his opinion, was not an important factor, and his colleague, Prof. J. Stopford, had given good reasons against the theory of muscular action, and Prof. Murray hoped that this inadequate explanation would now disappear from the text-books. It seemed clear that the excess of fat in the orbit was the essential cause of the proptosis in Graves's disease, and accounted for the persistence of that symptom in many cases after the subsidence of the other symptoms.

Prof. Murray then reviewed 300 cases of exophthalmic goitre which he had seen in private practice during the 11 years 1911–1921. Of these, 71 men and 229 women showed sex as an important predisposing factor. It had long been recognised that family predisposition occurred in some cases. That tendency was present in 26, or nearly 9 per cent. of his cases, and Dr. Hector Mackenzie had found it in 10 per cent. of 438 cases observed by him. In 38 of Prof. Murray's cases (13 per cent.) a sudden nervous strain had occurred, while prolonged periods of anxiety or worry owing to domestic or financial causes were recorded in 17 (6 per cent.) cases. In 15 soldiers under his care at the Manchester Royal Infirmary 4 had occurred after the explosion of a mine, and the others after exposure or the stress of general service, but none following a wound. The occupation of teaching appeared to be a predisposing factor, as 11 (4 per cent.) of his cases were school teachers. Septic infection occurred in only two cases. Influenza shortly preceded the onset in 18 cases. It was difficult to determine any influence of locality in the causation of exophthalmic goitre, but it was remarkable that 19 of his cases came from one part of the valley of the river Goyt, which divides Cheshire from Derbyshire. On the relation of simple parenchymatous to exophthalmic goitre, Prof. Murray said that in a certain number of cases of simple goitre symptoms of hyperthyroidism appeared, when the condition was known as toxic adenoma, and in a smaller number (12 in his series) definite exophthalmic goitre appeared; it was thus important to prevent and treat cases of paren-

chymatous goitre, which were so often regarded as harmless. Kimball, in America, had found that the administration of small doses of iodine, such as 3 gr. of sodium iodide daily for ten consecutive school days, each spring and autumn, to girls during the school age had been followed by a striking diminution in the number of cases of goitre in districts where it was usually endemic. But he considered treatment with iodine unsuitable for those who already showed signs of hyperthyroidism. The importance of a pure supply of drinking water must not be forgotten.

The speaker concluded with a brief summary of the medical treatment of Graves's disease. In slight or early cases rest and a suitable diet were indicated, combined with radiological treatment adapted to the needs of each individual. In cases of medium severity a similar course of treatment should be carried out for not less than six months, after which, if no definite improvement had occurred, operation might be advised. In cases where the symptoms were severe when the patient first came under observation, the risk of operation was considerable. He would like to know if those risks were lessened by a preliminary ligation of one or more thyroid arteries, which, as a rule, appeared to him to be unnecessary.

Dr. C. M. WILSON (London) emphasised the importance of treating cases of exophthalmic goitre in the early stages, when treatment by X rays, for instance, was much more successful than if applied later. He gave details of the method of basal metabolic measurements of the inspired air, and showed on the screen photographic reproductions of charts illustrating how the clinical course of the disease could be followed by means of those measurements. He thought those measurements would encourage physicians to treat cases at an early stage.

Mr. JAMES BERRY (London) spoke on the surgical aspect of the question, advocating coöperation between physician and surgeon. Dealing with the indications for and against operation, he did not agree with operation in every case; for instance, he would not operate on old cases of many years standing. X ray treatment should not be carried on too long, as it did no good in the ordinary cases. In ultra-acute cases operation should be avoided as it was most dangerous. Such cases should not be touched unless there was no evidence of myocardial degeneration, since patients with dilated hearts were apt to die suddenly after operation. Operation should never be undertaken as an emergency measure, but during a period of remission, the patient being under the surgeon's observation in a nursing home for at least seven days previously. With regard to preliminary ligation of arteries, in very large goitres, when the operation of removal would be too dangerous, he was in favour of tying one or both superior thyroid arteries. He had no use at all for ligation of the inferior thyroid artery. The preliminary ligation should be followed by removal of part or the whole of the gland. Patients were sometimes so much improved by ligation that they refused further operation. He had observed a tendency to sudden rise of the blood pressure, sometimes up to 200, taken during the operation, and sudden death occurring 24 hours after operation might be due to this cause, especially if the heart muscle was weak. He made it a rule never to operate on a frightened patient. Patients should be reassured, but the utmost that could truthfully be said was that the operation would be followed by great amelioration of most of the symptoms, except the exophthalmos. Dyspnœa was a symptom which could be relieved. Ether was the best anæsthetic in extremely small quantities; chloroform should never be used. He did not care for local anæsthesia. Mr. Berry concluded by detailing the results he had had in 78 operations—viz., practically cured, 53; much improved, 18; improved, 1; no improvement, 2; definitely worse, 1; died from the operation, 3.

Dr. J. R. RIDDELL (Glasgow) gave his experience of treatment by X rays, which he did not advise in cases of simple goitre.

Dr. G. C. PURVIS (Grahamstown, South Africa) expressed the opinion that exophthalmic goitre was due to microbic infection, and advocated treatment by a vaccine prepared from the patient's urine or fæces.

Prof. DAVID DRUMMOND (Newcastle-on-Tyne) exhibited some post-mortem specimens illustrating that in many there was a condition of lymphatism, almost amounting to status lymphaticus. In one of the specimens shown the thymus gland weighed 85 g. and there was a great increase of the peritonsillar lymphoid tissue. That was most marked during the early stages, and tended to diminish during the progress of the disease. He believed in treatment by large doses of iodide of potassium (12–15 gr.).

Dr. M. MAMOURIAN (Ashton-under-Lyne) said that he usually gave his patients a course of X ray treatment, mainly because this treatment was recommended by most medical men, but he believed that X ray treatment by virtue of the adhesions and fibrosis that it brought about, increased considerably the difficulties of the operation. The radiologist should refer the case back to the surgeon from time to time for an opinion. The dangers of the operation had been greatly exaggerated, partly because it was often undertaken by inexperienced operators and partly because of an unwise selection of cases. The fact that Mr. Berry's death-rate was only 5 per cent. showed that the mortality was sufficiently low in capable hands. He was satisfied that in no field of surgery was local anæsthesia more indicated than in operations for Graves's disease.

Dr. H. L. TIDY (London) asked when was an exophthalmic goitre cured? Under X ray treatment patients improved in pulse-rate and general condition, but the exophthalmos and enlarged thyroid still persisted.

Lieut.-Colonel ROBERT MCCARRISON, in a communication read by the SECRETARY, said that there was no satisfactory evidence that excess of thyroid secretion was poured into the blood in exophthalmic goitre. So long as they continued to concentrate attention on the thyroid gland alone they would fail to understand the disease. There was more reason to suspect adrenal than thyroid failure. Exophthalmic goitre was practically unknown in animals, which indicated that animals were free from some influence to which human beings were liable. The disease was pre-eminently one of modern civilisation, and might be due to several causes, such as deficiency of vitamins and other faulty food conditions. In some way the endocrine regulators of metabolism were at fault.

The CHAIRMAN summed up some of the features of the discussion. He thought that the exophthalmos was due to retraction of the upper lid rather than to deposition of fat. He agreed that the occupation of teachers definitely predisposed to Graves's disease. He was surprised that there had been no mention of the sympathetic nerve, and that they had heard nothing about treatment by drugs such as belladonna, bromides, &c. Emphasis had rightly been laid upon prevention, and the basic metabolic measurement of cases was most important.

Prof. MURRAY, in reply, dwelt on the difficulty of getting accurate results from metabolic measurements, as they were difficult to apply except in hospital practice. As to the enlargement of the thymus and other lymphoid tissue, that might either have a stimulating effect on the thyroid or be secondary to thyroid enlargement. He believed that drugs did good in some cases, especially arsenic and quinine hydrobromate. Iodides, in his experience, had bad effects, but that might be due to the small doses employed by him—viz., 5 gr.—whereas Prof. Drummond gave 5 to 15 gr.

FRIDAY, JULY 28TH.

At the third session the chair was taken by Sir ARCHIBALD GARROD (Oxford), a Vice-President of the Section, when a discussion on

Degenerative Diseases of the Liver

was opened by Sir HUMPHRY ROLLESTON, who

divided cases of degeneration of the liver cells into (1) those that were primary, or at least simultaneous with changes in the supporting and vascular tissues of the organ, including Kupfer's cells; and (2) those secondary to (*a*) gross disturbances of the vascular supply of the organ—e.g., in portal thrombosis or cardiac failure; (*b*) inflammation or suppuration, as in abscess, pylephlebitis, or cholangitis; and (*c*) biliary obstruction. He proposed to direct attention almost exclusively to the first group, which he classified as (1) acute and subacute, and (2) chronic.

(1) *Acute Degenerations of the Liver.*—Zonal necrosis of the central hepatic lobules have been found to be specially connected with streptococci infection, and more recently that change was found to occur as a result of tetrachlorethane, trinitrotoluene, and arsenobenzol poisoning. A less virulent process was acute parenchymatous, degenerative, or cloudy swelling of the liver cells, which occurred in various fevers and infections. Acute and subacute hepatitis such as malarial hepatitis, which showed attempts to repair the accompanying degeneration, were less prone to be followed by cirrhosis than the forms showing mainly degeneration. Syphilis in its early stages might produce a benign jaundice which was probably due to disordered action of the liver cells, and not to intrahepatic and intralobular obstruction. Since the treatment of syphilis by arsenobenzol compounds had become general, the incidence of benign jaundice (0·56 per cent. among 39,377 military cases) and of acute yellow atrophy had increased.

Spirochætosis ictero-hæmorrhagica was an example of the syndrome of hepato-renal insufficiency, in which both organs were affected by the causal agent, and thus differed from the cases in which the kidneys underwent degenerative changes from the intoxication due to grave hepatic lesions.

Toxic Jaundice.—During the war 100,000 persons in this country worked in *trinitrotoluene*, and among them 404 cases of toxic jaundice were reported to the Home Office, but after preventive measures were introduced, as the result of the late Benjamin Moore's demonstration that the absorption of trinitrotoluene took place through the skin, the incidence of jaundice fell in a remarkable manner. *Tetrachlorethane* was employed early in the war as "dope" for rendering the wings of aeroplanes impervious to air and moisture, and in November, 1914, cases of toxic jaundice appeared. Up till July, 1916, when its use was given up, there were in all 70 cases of jaundice, with 12 deaths. That form of jaundice was due to the inhalation of the vapour of tetrachlorethane, and caused first fatty change in the liver, kidneys, and heart, and then extensive degeneration of the liver cells, with diminution in the fat content. With regard to *chloroform* poisoning, it had been shown experimentally that sugar given before anæsthesia protected the hepatic cells against damage by chloroform, and when given after anæsthesia enabled the cells to recover rapidly; that proteins were much less effective in this respect; and that the administration of fats facilitated the changes in the liver cells. The practical application of those experiments was obvious.

Clinical Manifestations.—These varied greatly. In the severe forms there might be jaundice, cholæmia, and other obvious signs of hepatic insufficiency—as in acute yellow atrophy and icterus gravis; on the other hand, in the slight cases jaundice might be absent, and it was only by tests for hepatic insufficiency that the existence of impaired function of the liver could be established. In degeneration of the liver the multiple functions of its cells were, at any rate from a clinical point of view, less impaired than might have been anticipated; on that point their knowledge was probably more deficient than was generally recognised, and should be greatly extended by the wide employment of the recent tests for functional efficiency.

Prognosis.—The prognosis of cases in which recovery from clinically severe acute degeneration of the liver had occurred, and in which the liver had undergone permanent damage, such as subacute atrophy with cirrhosis and compensatory hyperplasia, was a subject on which more information was desirable; many such cases must have arisen from trinitrotoluene poisoning, or from non-fatal sporadic acute yellow atrophy, or from the ill-effects of salvarsan treatment.

(2) *Chronic Degenerations of the Liver.*—Pathological fatty accumulation of the liver cells resulted from degeneration due to infective and toxic processes. In such cases jaundice was frequently absent. *Amyloid* liver was an infiltration of the vascular framework of the liver, often accompanied by secondary degeneration, but not leading to cirrhosis.

Cirrhosis.—Portal or multilobular cirrhosis was the result of attempts to repair the damage done by multiple degeneration of the cells in the peripheral and intermediate zones of the lobules. That process was usually chronic, but occurred acutely in subacute atrophy and in tetrachlorethane and trinitrotoluene poisoning. The factor of alcohol in producing cirrhosis was now recognised as one only of the conditions that might directly or indirectly produce local degenerations followed by repair of the liver. Attention had recently been drawn to the part played by syphilis in the ætiology of cirrhosis, and tuberculosis was also stated to be a cause. Active cirrhosis was characterised almost constantly by hyperglycæmia, and generally by the presence of bile salts and urobilin in the urine.

It was now considered that there was an intrahepatic formation of urobilin from bilirubin, with an excess of urobilin in the duodenum and a deficiency of hæmoglobin in the blood. The pigmented cirrhotic liver of hæmochromatosis presented several features of interest. It was now generally agreed that iron was retained in the body, especially in the liver, which was normally concerned with the storage of iron and the metabolism of blood pigment. The damaged liver cells were unable to deal with the pigment, which therefore accumulated, with the result that further cell destruction and secondary cirrhosis followed.

In conclusion, Sir Humphry Rolleston suggested the following points for discussion by the Section:—

1. The tests for functional efficiency of the liver: their scope, limitations, and results, especially in slight and latent degenerations.
2. Is the jaundice occasionally seen in early syphilis, in syphilitic patients after arsenobenzol treatment, and the jaundice of munition workers due to an additional factor—viz., infection—or does it merely depend on inherent weakness of the liver?
3. What is the explanation of the delayed onset of symptoms in persons previously exposed to the action of poisons such as trinitrotoluene and arsenobenzol preparations?
4. In degenerative diseases of the liver is jaundice due to (*a*) failure of the damaged cells to remove from the blood bilirubin formed elsewhere, or (*b*) do the liver cells, as the result of disordered function, shunt the bile pigment into the lymph-like capillaries instead of into the biliary capillaries?
5. Is anæmia in hepatic degeneration due to failure of the liver cells to re-synthesise urobilin and iron into hæmoglobin?
6. The intra-hepatic formation of urobilin.
7. How far is the incidence of cirrhosis after hepatitis accompanied by degeneration of the liver cells obviated by concomitant hyperplasia of the liver cells?
8. Is the interstitial hyperplasia in cirrhosis initially a beneficial process?
9. The value of hæmosiderinaria in the diagnosis of hæmochromatosis.
10. The relation of primary carcinoma of the liver to a previous degeneration and de-differentiation of the liver cells.

Prof. MCLEAN dealt with the tests for the functional efficiency of the liver which were not so satisfactory as in the case of the kidney, as we knew so little of the functions of the liver. With regard to the lævulose test, no amount of sugar given to a normal person

would cause the blood-sugar to rise above 0·17. If we gave a patient 30 g. of lævulose in 30 oz. of water and found there was a rise in the blood-sugar it was fairly good evidence that he was suffering from an affection of the liver, if there was no diabetes present. He referred to experiments on puppies which stood the inhalation of chloroform very well, but very bad effects occurred if the glycogen was removed from the liver. That the liver cells were protection against poisons was shown by experiments of Colonel Harrison, who had two sets of patients under arsenobenzol treatment. To one set he gave no sugar, and had 47 cases of toxic jaundice among them. The other set received 100 g. of glucose each, and only two cases of jaundice occurred. With regard to the connexion between cirrhosis of the liver and alcohol, Prof. McLean said that no experiments had been found to show the causation of cirrhosis by alcohol. There were many cases of cirrhosis among teetotal cows. In every human being there was a certain amount of alcohol present, as a result of the fermentation of carbohydrates, and it was possible that cirrhosis was caused by some of the higher alcohols formed from food.

Dr. C. M. WILSON (London) remarked that in the lipase test it was only positive when there was advanced degeneration of the liver, and the test was no longer useful. The only tests he thought at all useful were the lævulose test and the hæmato-basic test.

Dr. J. C. SPENCE (London) dealt at length with the lævulose test, and showed on the screen several photographic diagrams illustrative of the test.

Dr. J. W. MCNEE (London) exhibited on the screen several micro-photographs illustrating the minute anatomy of the liver, and passed round some coloured photographs of the same. He said that the bile pigment was formed practically entirely in the endothelial cells of the liver and spleen and not in the polygonal cells. He distinguished three varieties of jaundice: (1) Jaundice due to obstruction to the outflow of bile; (2) jaundice due to increased hæmolysis when the icterus was of a fairly light degree—e.g., acholuric jaundice and icterus neonatorum; (3) when there was no increased hæmolysis, but the polygonal cells were damaged and the Kupfer cells not affected. The extent of the jaundice gave no indication of the amount of damage to the liver cells.

Prof. R. MUIR (Glasgow) also spoke on the anatomical aspect of the question.

Sir W. H. WILLCOX (London) dealt with the toxiological aspect of the hepatic functions, one of which was the protection of the body against exogenous poisons. That might be described as a toxi-phylactic function. There were two factors concerned in it—viz., the intensity of the poison, and the susceptibility of the liver at the particular time. On the question whether jaundice was caused by trinitrotoluene and tetrachlorethane poisoning, he might say that in 1914 he made an investigation into tetrachlorethane poisoning, and found practically all the workers in the industry suffering from liver poisoning; there was scarcely a sound liver among them, and he had no doubt that the toxic jaundice was due to the poison. He referred to the delayed onset of jaundice in arsenical poisoning, in which the latent period varied from 10 to 64 days. It took three weeks to excrete a dose of salvarsan, and the patient was saturated with arsenic for months. In such cases there was a re-absorption of arsenic, traces of which might be found in the liver. Some cases of delayed arsenical poisoning were due to the effect that the poison had on the liver cells, causing cloudy swelling and fatty degeneration.

Prof. M. J. STEWART (Leeds) said that in cases of hæmochromatosis there was a correspondence between the amount of iron and the cirrhosis. With regard to primary carcinoma of the liver, its occurrence enormously preponderated in organs already cirrhotic.

Dr. MCDONALD (Glasgow) attributed acute yellow atrophy of the liver to bacterial infection.

The CHAIRMAN, summing up the discussion, said that they had learned how little they knew on the subject; but the laboratory was coming to the aid of clinical medicine, and there was no doubt of the value of the tests referred to, especially the lævulose test. In his experience a large proportion of patients with cirrhosis of the liver had a certain amount of siderosis. The effect of glucose in delayed chloroform poisoning had been known for a long time, but its administration in patients under treatment by arsenobenzol was important. He was convinced that urobilin was formed by intestinal bacteria and re-absorbed by the liver.

SECTION OF PATHOLOGY.

HUMAN AND COMPARATIVE.

WEDNESDAY, JULY 26TH.

THE first meeting of this section was held under the Presidency of Prof. R. MUIR, when a discussion took place on

The Origin of Cancer in Relation to Specific Forms of Irritation.

Prof. Muir in a brief introductory speech called attention to the importance of recent experiments upon the production of malignant tumours by the application of specific irritants.

Dr. J. A. MURRAY (London), who opened the discussion, gave a short review of the literature. The work of Prof. J. Fibiger dealing with the production of tumours in the stomach of rats infected with *Spiroptera neoplastica* was first discussed. The experiments of Yamagiwa and Itchikawa on the tumours caused by the repeated applications of tar to the ears of rabbits had not given conclusive results, but the experiments of later workers had been more successful owing to the use of mice. Dr. Murray dealt with the important question of mouse cancer in its relation to human cancer, and emphasised the fact that once a tumour had become malignant as the result of the application of an irritant it was indistinguishable from the tumour produced by any other specific irritant. The studying of tar tumours in the mouse was facilitated by the rapid course of the development of the neoplastic changes as compared with the human subject, where the whole process was so long that in the lifetime of any one observer only a few experiments could be studied and information had to be pieced together from different cases. The mouse experiments bore the same relationship to human experiments that the "rapid cinema" did to the ordinary cinema. In drawing deductions from animal experiments there were many pitfalls and dangers. The rat for example, was insusceptible to tar applications; no one had as yet produced tar cancer in the rat. Rabbits were also difficult animals for this purpose and definitely malignant growths in these animals were rare. Dr. B. R. G. Russell, on the other hand, had been successful in producing a sarcoma in a rat by subcutaneous inoculation of tar. Dr. Murray showed numerous diagrams of tar cancer in mice and dealt in some detail with lymphatic gland and lung metastases. The difficulty of settling the question of malignancy of the primary tumours by histological examination was considered and the results after operative procedure were given. The similarity of the mouse experiments with the post-operative results in the human subject as regards late recurrences at the site of the primary tumour and in lymphatic glands was emphasised. Dr. Murray gave the results of an experiment in which 60 mice were painted regularly with whole tar, alcoholic extract of tar, and ether extract of the same tar. The ether extract gave the most uniform and successful results; the alcoholic extract gave poor results, but occasionally tumours were caused by the alcoholic extract when the whole tar and ether extracts failed to produce them. These cases were difficult to explain. The possibility of the occurrence of one growth preventing the appearance of another tumour was discussed. For example, an animal in which a tar cancer had been produced and the tumour successfully removed by operation appeared to be insusceptible to the further prolonged application of tar. Such an animal, however, was still susceptible

to grafts of its own tar tumour. While it was not immune to cancer, it appeared to have developed resistance to the production of another tumour by the same irritant. This might have some bearing on the question of the multiple origin of tumours.

Dr. ARCHIBALD LEITCH (London) spoke of the production of cancer in man and animals by irritants other than tar. The Shale oil industry had been in operation in Scotland on a large scale for over 50 years, but only 20 cases of carcinoma of the skin from exposure to paraffin had been reported from all over the world; more had probably occurred but had not been published. The early works of Sir Alex. Ogston in this country, of Volkmann in Germany, and others were referred to. Dr. Leitch then gave the results of his experimental work on mice. Shale oil gave negative results, but it was exceedingly difficult owing to the high death-rate in these experiments to ensure that a sufficiently long exposure had been given. Certain other fractions of oil, however, had proved successful. Multiple papillomata and malignant tumours had been obtained in a number of mice after some months of application. Papillomata, carcinomata, and sarcomata had occurred together in these mice. Undoubted carcinoma and sarcoma could therefore be produced by paraffin fractions. Dr. Leitch discussed the relation of arsenic to cancer, a point which had frequently been raised, and gave the results of his experiments on mice using solutions of arsenious acid. The death-rate was exceedingly high. In one mouse the repeated injection between the shoulders of 0·013 per cent. solution of arsenic in alcohol had resulted in small papillomata in two and a half months. These developed progressively and the animal died in five and a half months with a malignant tumour and metastases.

Dr. ALEX. SCOTT (Broxburn) dealt with his experiences among the paraffin workers in his district and showed numerous lantern plates illustrating types of skin lesions. A papular dermatitis was fairly common owing to the paraffin having obtained entrance into the hair follicles. These papules might become indurated and warts might develop. A more severe form of dermatitis in which the skin became reddened, polished, indurated, and scarred was also described. Simple paraffin warts might occur; epithelioma of the scrotum due to oil was occasionally found. Rodent ulcer occurring in these men must be regarded as possibly due to exposure to paraffin products. Nineteen cases of paraffin epithelioma were given; 63 per cent. of these occurred on the forearm and 30 per cent. on the scrotum. Among about 5000 paraffin workers in Scotland 44 cases of epithelioma had been traced; 50 per cent. of these were primary growths on the scrotum. Prolonged exposure to paraffin products was necessary before the severe forms of dermatitis developed, probably 10 to 15 years. Paraffin epithelioma did not develop till from 20 to 40 years after service in the paraffin sheds.

Dr. T. M. LEGGE (London) gave statistics of cases of epitheliomatous ulceration reported between January, 1920, and June, 1922, as due to pitch, tar, and paraffin. Of the 95 cases during this period 66 were due to pitch, 21 to tar, and 8 to paraffin. The age-distribution of the cases was discussed. The bulk of the cases (90 per cent.) occurred at from 40 to 60 years of age and the duration of employment in these cases was long (20 to 40 years). Interesting particulars regarding the situation of the lesions were given. The most common site was the scrotum—29 cases. The eyelid, cheek, forearm, and lip accounted for 35 other cases. Other figures were given relating to the precise occupation. Blast furnace pitch, which was free from heavy oils (creosote, &c.), did not cause the skin to become swarthy, and no case of epithelioma had been reported up to 1910 or since. Severe ulceration was frequent in chrome workers, but no case of epithelioma had been reported. It would appear that some specific irritant was lacking from these substances.

Mr. CECIL ROWNTREE (London) discussed X ray dermatitis and cancer. Up to 1909 there had been reported 11 English and 9 American cases of X ray cancer. Nine cases proved fatal. Since 1909 only two new cases had occurred and he attributed this to the methods of protection which had been used. A very slight protection sufficed to prevent X ray dermatitis. Prolonged exposure to the rays led to burns, warts, ulcers, and carcinoma. These cancers were very superficial, were clinically doubtful, but histologically malignant. Multiple tumours were common, but local recurrences and metastases did not occur. The sclerotic changes in the connective tissues and lymphatics probably explained this. Numerous exposures were essential and a long succession of burns was necessary for the production of carcinoma. The smallest period of exposures on record was about five years. Cancer might develop long after the period of exposure. The question of specificity of X rays in regard to the causation of cancer was discussed. X ray cancer occurred in young people, usually on the dorsal aspect of the fingers, and was frequently multiple. The production of experimental cancer by means of X rays had failed, but this was probably due to too short duration of the experiments.

Dr. JOHN CRUICKSHANK (Aberdeen) gave the results of a series of tar experiments in mice. The tar used had been prepared 10 years previously and was applied twice weekly. Of the 67 mice 31 developed tumours and of these 20 proved to be malignant on histological examination. During the period of tarring two mice had developed spontaneous cancer of the breast. These mice did not produce tar tumours although the duration of tarring was very prolonged. Sections of the skin of the tarred areas in these mice showed in one case a small area of epithelial proliferation in a hair follicle. It was suggested that the presence of spontaneous cancer had inhibited the production of tar tumours. Dr. Cruickshank drew attention to the excessive keratinisation which most tar tumours exhibited, and suggested that many of these tumours had their origin in the hair follicles. As in the experience of other workers, he had found that a tar tumour of apparently simple character might give rise to metastases in lymphatic glands. No difference was found in the incidence of tumours in young as compared with old mice, and many of the tumours were of multiple origin.

Dr. PASSEY (London) reported a series of experiments with extracts of soot, using mice as experimental animals. The efficiency of an ethereal extract, an extract made with ether after mixing the soot with lime, and an extract made with ether after previous treatment of the soot with mineral acids and alkalies was compared. The most efficient extract was found to be that made from soot mixed with lime. 50 per cent of the mice which survived more than three months developed malignant tumours. Experiments were also made to test the effect of deficiency of fat-soluble A-vitamin. No appreciable difference was found in the incidence of tumours. The mice on vitamin-poor diet appeared to give papillomata more readily.

Dr. HOLLINS, Dr. H. J. CAMPBELL (Leeds), Dr. D. MCKAIL, and Lieut.-Colonel F. P. MACKIE also took part in the discussion.

Prof. MUIR, in summarising the results of the discussion, emphasised the long duration of irritation necessary to produce cancer. The results were interesting in connexion with the occurrence of sarcoma after fracture. The war had produced many fractures but no increase in sarcoma had been noted. The all-important question as to the change in the cell in cancer was still unsettled.

THURSDAY, JULY 27TH.

At this session a discussion took place on

Animal and Vegetable Pathology in Relation to Human Disease.

Prof. FREDERICK HOBDAY (London) said that animal and vegetable pathology had many points in common with the study of human disease and that he would deal with the salient points relating to the

diseases of animals which were communicable to man. The important part played by the veterinarian in preventing the communication of animal diseases to man was not well known or sufficiently appreciated. Glanders, rabies, anthrax, tuberculosis, foot and mouth disease, cow-pox, mange, ringworm, and certain forms of seborrhœa were all indisputably communicable to man. Diseases of animals due to parasites were important. Other diseases in animals were analogous in symptomatology, in the situations of the body which were attacked, and in the ravages set up in the various body organs to human ones. Cirrhosis of the liver, for example, was common in old animals but could not be referred to alcohol. The study of cancer in animals was equally interesting, and the situations on which it occurred in various animals was well worth serious study when considering any theory of cancer. The immunity of animals to various diseases was of enormous value to students of disease. The danger of the animal as a carrier of disease must not be forgotten, and a knowledge of the habits of the animal in health was as useful and necessary as a knowledge of symptoms in disease. Organised collaboration between veterinarians and medical men could achieve great results. Glanders and rabies were instances of two diseases primarily of animals which had been dealt with most successfully. In 1901 some 2370 horses were destroyed for glanders, whereas for this year, up to the present, no case has been reported. The discovery of mallein and the mallein test had placed in our hands an infallible method for the detection of glanders, and the disease could within a very short space of time be eradicated. With regard to rabies, owing to the watchfulness of the veterinary officials Great Britain was free for 20 years until the much-dreaded disease obtained a foothold in 1918. With the prevailing regulations and by means of laboratory examination a diagnosis of rabies could be obtained in 96 per cent. of suspect cases within a few hours. It was a tribute to the memory of Pasteur that no deaths from hydrophobia had occurred in England. Anthrax in man and animals has been much in evidence in late years and much sterner preventive measures must be used. It was troublesome and difficult to control, but if the disinfection of hides, wool, and hair could be enforced there would be an immediate diminution in the human cases, as the disease practically always reaches man through animals. In tuberculosis we had an important and devastating disease which was of extreme importance to veterinarians and medical men alike. Over 10,000 children died annually of tuberculosis and fully a million tuberculous cattle existed in Britain at the present day. The report of the medical officer of health for the City of London for 1921 stated that out of 50 consecutive samples of milk purchased in the city no less than 1 in 4 proved tuberculous. Given a free hand, veterinarians could stamp out tuberculosis in cattle. The time and money spent would be small in comparison with the saving of enormous numbers of human lives. A method of immunisation of calves, introduced by Dr. Nathan Raw, was on trial. If successful it would be a great boon to agriculture and to mankind. Prof. Hobday dealt shortly with foot and mouth disease and cow-pox, and more fully with mange and ringworm. In conclusion, he again made a plea for better coöperation between medical men and veterinarians.

Prof. W. H. LANG (Manchester) dealt with some aspects of vegetable pathology in relation to human disease. Direct comparisons between the normal development and construction of plants and animals had often proved more misleading than helpful. False analogies when the comparison was extended to pathological processes must be guarded against. Pathological processes and reactions had a long evolutionary history. Occasional records could be got from fossil plants such as had recently been obtained in the Old Red Sandstone of Scotland. These plants showed clearly the pathological changes due to exposure to noxious gses. Necrosis and tissue reaction leading to the formation of wound-callus was clearly evident and closely resembled the changes found in modern plants when exposed to irritating gases. There was a general correspondence between the healing of a wound in the plant and the animal body, but specific comparisons were difficult owing to the absence in plants of nervous, blood vascular, and lymphatic systems. Of late years very direct comparisons had been made between a remarkable disease of plants known as "crown gall" and malignant tumours in man and animals. The tumour-like growths of crown gall had long been known, especially in relation to wounds of cultivated plants from horticultural operations such as grafting. The disease had been shown to be transmissible from one plant to another. Erwin Smith and Townsend had demonstrated that the disease was due to a bacterium, the *Bacterium tumefaciens*. This had been obtained in pure culture, and the experimental production of the disease had been successfully carried out. Infection occurred only through a wound, and galls were obtained on roots, stems, and leaves of many plants, attaining the largest size in immature tissues or in the cambium of stems with secondary growth. Especially large growths formed on the root of the sugar beet. Secondary tumours appeared in some cases at a distance from the main tumour. Irregular growths containing more or less altered organs resulted when inoculation was made into apical or axillary buds. The tissues showed an irregular multiplication of cells. Smith was of opinion that there was actual infiltration of tumour cells into the normal tissues and had made close comparisons of these tumours with malignant tumours in man and animals. Prof. Lang said that it was necessary in discussing these growths to take into our account the normal construction and mode of growth of the affected portions of the plant as contrasted with animal tissues; the reactions to wounding in plants; the reactions of the plant to parasitic organisms; and the relation of tumour formation in the plant to wounds and parasites. An essential difference between plants and animals lay in the continued development of most plants. The formation of new organs and tissues continued throughout life at the growing points of stems and roots. Experiments in regard to the wounding of plants had shown that considerable amounts of new tissue, "callus," might be formed, in which new growth of immature shoots or roots might develop. The numerous new growths or galls of plants due to parasitic animals were due in part to wounding, but more to the secretions and excretions of the parasite. Multinucleated cells were found in some. Many bacterial diseases of plants were attended by little or no new growth, but that was not invariable. The bacteriosis of the olive tree and the tubercles of leguminosæ were examples of irregular tumour-like growths. Further, Prof. Lang was not convinced that there was any invasive action of the tumour cells in the crown galls. A consideration of all the phenomena appeared to bear out the apprehension as to the soundness of detailed and direct comparisons between particular diseases in plants and animals.

Sir CLIFFORD ALLBUTT (Cambridge) said that it was interesting in discussing this matter to recall that in 1882 he had emphasised the importance of a study of comparative pathology. It was better, he thought, to study the reactions of simple animals and plants as the process was more simple and uncomplicated in the absence of nervous and circulatory systems. Incidentally it was important to note that these mysterious and important substances called vitamins were formed only in plants. Even cod-liver oil was derived indirectly from green algæ and plankton. It was a mistake to regard disease as an entity. It was a deviation from the normal, a modification of the physiological life of the organism. It was necessary to remember that only by comparison was it possible to bring out the master principles which lie at the basis of all nature.

Prof. H. E. GAIGER (Glasgow) said that the long list of animal diseases given by Prof. Hobday which were communicable to man could be greatly extended if

we went to foreign countries. Mallein, which had enabled us to eradicate glanders, had been invented by a Russian veterinary surgeon. Pasteur, who had done so much for human life, was neither medical nor veterinarian. With regard to anthrax the disease was difficult to eradicate owing to the sporing character of the organism. There were two sources of infection, the disease in animals and the hides, wool, and hair which were imported. Very little was being done in connexion with these imported articles. In respect to tuberculosis, which was rampant in animals, the disease was easily diagnosed and the only difficulty in dealing with it was the absence of funds. It had been shown that "braxy" was due to an infection of the stomach by one of the anaerobes, which had been found during the war in connexion with gas gangrene of wounds. A veterinary research committee on the lines of the Medical Research Council was desirable.

Sir WILLIAM MACEWEN, President of the Association, expressed great interest in all the papers; it was a matter of the greatest moment to study all conditions of life and disease.

Mr. W. B. BRIERLEY (Harpenden) agreed with Prof. Lang that it was a definite over-simplification and falsification to draw analogies between plant and animal diseases. The gulf between the anatomy, physiology, and pathology of plants and animals was unbridgeable. In plants, as in animals, there were definite diseases which were not due to any infective agent, but produced by external influences—heat, light, moisture, gases, and liquids. No comparisons were permissible. In considering parasitic diseases which were common in plants there was probably more close contact between animal and plant pathology. In this field knowledge of the pathogenic effects of the parasites was much more important than knowledge of reactions of the host. Virus diseases existed in plants as in animals. Evidence had been obtained that disease in plants might be due to bodies of the Rickettsia and Negri type. He put forward a plea for more liaison between mycologists and medical bacteriologists.

A paper by Dr. WALTER ELLIOT, M.P. (read by Dr. J. B. ORR), dealt with dietetic deficiencies in animals and bone lesions in children. The main facts of this paper were brought out in the proceedings of the Section of Physiology, which will be reported shortly in THE LANCET.

Mr. ARTHUR GOFTON, F.R.C.V.S. (Edinburgh), discussed the risks run with carcases of animals dying of anthrax. No instance of infection from the alimentary tract after eating had been recorded. With regard to mange this disease was extremely rare among men in France, though very many mangy horses were handled. In respect to tuberculosis, 43 per cent. of all cattle were infected, but in 80 per cent. of cases it existed in a form not likely to be of danger to man. Only generalised tuberculosis was dangerous (7·2 per cent.). Tuberculosis of the udder existed in only 1 per cent. of cases.

FRIDAY, JULY 28TH.

At this session various papers were read.

Prof. STUART MCDONALD and Dr. A. F. BERNARD SHAW (Newcastle-on-Tyne) communicated a paper on

Splenomegaly with Eosinophilia,

wherein they discussed an interesting case of enlarged spleen associated with leucocytosis and an unusually high degree of eosinophilia. The spleen was removed owing to the discomfort caused by the tumour. The case was followed for many months. The leucocyte count rose steadily after operation and there was a corresponding rise in eosinophiles (up to over 80 per cent.). Observations were made upon the behaviour of the eosinophile polymorphs in regard to their power to ingest staphylococci. Blood drawn from a vein and allowed to stand for several days showed the development of numerous Charcot-Leyden crystals within the eosinophile cells. Only two other cases of eosinophilia of the degree recorded in this case have been previously published.

Prof. J. SHAW DUNN (Birmingham) read a paper on Chronic Interstitial Nephritis and Arterio-sclerotic Kidney. Prof. Dunn dealt with the difficulty of nomenclature of contracted kidneys and instanced classifications from several standard pathological works. He suggested the following three groups: (1) Secondarily contracted kidney; (2) primary chronic interstitial nephritis; (3) arterio-sclerotic contracted kidney. With regard to the first there was little difficulty, but many different views were held regarding the second group. The clinical features of this group were rapid or sudden onset with no previous history of renal trouble, absence of œdema, cardiac enlargement, polyuria, high blood pressure, and frequently uræmia. The kidneys were small, hard, with adherent capsules and harshly granular surfaces, red or mottled in appearance. Histologically, there was much fibrosis of irregular distribution. Great contrast was shown in areas of the cortex, where areas of sclerotic glomeruli were found in association with areas of hypertrophic glomeruli. In the group of arterio-sclerotic kidneys there were two types, one in which large vessels were affected with resulting coarse scarring and the other where small vessels were affected. The latter form simulated primary cirrhosis.

Dr. E. H. EASTWOOD (Liverpool) read a paper on the Relation between Oxyuris Vermicularis, Local Eosinophilia, and Appendicitis. He said that there were great differences in the findings of various authors with regard to the presence of oxyuris vermicularis in the appendices of cases of appendicitis. The author examined 73 appendicitis cases and 50 normal appendices. Oxyuris was found in 19·2 per cent. of cases of the first group and in 28 per cent. of the normals. During appendicitis there was found to be a rapid rise and fall of polymorphs, but the eosinophiles rose more slowly, attaining a maximum about the twefth day and showing a slow fall. The eosinophiles were associated with the process of healing.

Drs. W. MACADAM and CECILIA SHISKIN (Leeds) communicated a paper on Blood Cholesterol in Anæmia: its Relation to Splenic Function. A low cholesterol content of the blood was found in practically all cases of severe anæmia. Three cases of hæmolytic jaundice and one case of splenic anæmia were carefully examined before and after splenectomy. All four cases showed very marked rise in the cholesterol content of the blood after the spleen was removed. In the first case a very low cholesterol content before splenectomy (60 mg.) became normal after 12 weeks (180 mg.). In two other cases the cholesterol became doubled or trebled within three months after operation. In the cases of hæmolytic jaundice there was rapid disappearance of the icterus after splenectomy, but no change was found in the fragility of the red cells.

Dr. CHARLES BENNETT, Dr. J. W. S. BLACKLOCK, and Prof. C. H. BROWNING (Glasgow) communicated a paper on the Action of Flavine Antiseptics in Local Pyogenic Infections, with Special Reference to the Process of Healing. This was a record of 650 cases of severe ulceration with sepsis treated with flavine by Dr. Charles Bennett. The healing has proceeded uniformly and satisfactorily with no formation of a yellow pellicle or any trace of inhibition of ingrowth of epithelium. Lantern slides of histological preparations of wounds under flavine treatment were shown. Healthy granulation tissue and normal ingrowth of epithelium was seen in each case. Skin grafts grew exceedingly well on surfaces dressed with flavine substances. Even if the grafts themselves were treated with flavine normal growth occurred provided that the dressing was a pervious one. The inhibition of growth reported by certain observers after flavine treatment must be due to some complicating factor, not to flavine.

Dr. D. F. CAPELL (Glasgow) read a paper on Intra-vitam Staining: its Application to Pathological Investigation. By means of intra-vitam staining a criterion was obtained by which connective tissue and endothelial cells could be recognised. The method could be applied to the examination of pathological conditions.

Prof. M. J. STEWART (Leeds) read a paper on the Healing of Gastric Ulcers. By distending the stomach

with water, cutting along the great curvature, wiping the mucous membrane clean, and making a careful examination, scars of gastric ulcers were frequently found. The scars were smooth and were represented by areas of the stomach thinner than the rest of the wall, with fine radiations. Peritoneal thickening was usually perceptible. Microscopically fibrosis of the muscular coat was the criterion of scarring. The mucous membrane was usually intact. In 602 post-mortems ulcers were found 18 times and scars 14 times. In 5900 post-mortems taken from the records gastric and duodenal ulcers were found in 5·7 per cent. of cases. In the stomach single scars were four times as common as multiple scars, in the duodenum 16 times as common. Acute ulcers were nearly always multiple, chronic ulcers single. The relation of ulcers to carcinoma was examined. The incidence of cancer in 98 cases was 11·5 per cent. There was no relation of cancer to scarring.

THE EXHIBITION.

I. THE MEDICAL EXHIBITION.

(*Continued from p. 301.*)

(1) DRUGS.

IN this group, as under the next, one or two additions may be made to the report which appeared in THE LANCET last week.

67. T. and H. Smith, Ltd. (Wheatfield-road, Edinburgh). This firm showed many samples of their alkaloids as well as pharmaceutical material like concentrated infusions and gelatine capsules. A full series of opium alkaloids was on view, including such rare products as the hydrochlorides of emetine and cotarnine. At the adjoining Stand 68, C. J. Hewlett and Son, Ltd. (83–85, Curtain-road, London, E.C. 2), had on view a large selection of original preparations. Several of these have earned popularity over a long period of trial, and we may mention Mist. Pepsinæ Co. c. Bismutho, Mist. Damianæ Co., and Liquor Santal Flav. c. Buchu et Cubeba.

Foods of value in sick rooms and nurseries, though not coming strictly under the head of drugs, should be mentioned in the same group. 69. Horlick's Malted Milk (Slough, Buckinghamshire). This preparation has been recognised as possessing useful restorative powers and has been employed in the constitutional treatment of protracted cases. One of its great conveniences is its ease of preparation. The same may be said for the products of (70) Oxo Ltd. (Queen-street Place, London, E.C. 4). This well-known fluid-beef is made in two forms, a seasoned form for ordinary use, and peptonised, and an unseasoned form prepared with a special eye to invalids. Handy little cubes are also supplied. 76. Sister Laura's Food (Bishopbriggs, near Glasgow). This food was prepared by a hospital sister for use in a large Scottish children's hospital, and its value as an invalid diet is proved by the fact that it is in considerable demand by the medical and nursing professions.

Erratum.—We regret that by an obvious slip in the description last week of "Ethanesal"—40. Savory and Moore, Ltd. (143, New Bond-street, London, W. 1)—the anæsthetic was alluded to as an antiseptic. It is a 5 per cent. solution of mixed ketones, saturated with ethylene and carbon dioxide gases, dissolved in detoxicated ether. It contains no alcohol.

(2) X RAY APPARATUS AND INSTRUMENTS.

75. The Genito-Urinary Manufacturing Co., Ltd. (66, Margaret-street, London, W. 1). This firm showed a large number of urological and genito-urinary instruments, frequently designed by well-known specialists. Among these we noted a new operating cystoscope introduced by Mr. Swift Joly. This instrument, which is designed to fulfil the need of a single cystoscope through which all the modern endovesical operations can be performed, was figured and described in THE LANCET of June 24th, 1922. With its use it is possible to change from a double catheterising to a single catheterising or a retrograde cystoscope without removing the sheath from the bladder. 82. De Trey and Co., Ltd. (23, Swallow-street, London, W. 1). The Castle Sterilisers were the feature of this Stand; they are the product of a factory which for 30 years has been devoted exclusively to the manufacture of high-grade sterilisers and bacteriological apparatus.

(4) BOOKS.

Exhibits of medical books, &c., were sent by several of the best known medical publishers:—23. W. B. Saunders Co., Ltd. (9, Henrietta-street, London, W.C.) showed, among other books, the Mayo Clinic Papers and Foundation Theses, Moynihan's Surgical Essays, Stookey's Surgical and Mechanical Treatment of Peripheral Nerves, and new editions of Garrison's History of Medicine and Stelwagon and Gaskill's Skin Diseases. 31. John Wright and Sons, Ltd. (Bristol) displayed, among other exhibits, copies of the Medical Annual, Hey Grove's Modern Treatment of Fractures, Makins's Gunshot Injuries of Blood-vessels, the Indexes of Differential Diagnosis, Prognosis, and Treatment, and various useful account books, filing cards, and professional visiting lists. 38. The Museum Galleries, who showed various engravings, including portraits of celebrities of science and medicine. 44. W. R. Ellis (9, Lovell's-court, E.C. 4) presented for inspection a large assortment of medical, surgical, and dental books as specimens of their well-known work on distributing agents. 51. The Oxford Medical Publications (1, Bedford-street, Strand, London, W.C.) showed among their more recent books Munro Kerr's Clinical and Operative Gynecology, Byam and Archibald's Tropical Medicine (Vols. I. and II.), the Papers of the St. Andrews Clinic, Guy's Hospital Reports (new series), Keynes's Blood Transfusion, Stiles and Brown on Peripheral Nerve Surgery, Turrell's Electro-therapeutics, Shaw's Hyperpiesia, and the new edition of Ashby and Wright's Diseases of Children. 72. H. K. Lewis and Co., Ltd. (Gower-street, London, W.C.) presented for inspection at their Stand Little's Artificial Limbs and Stumps, Macleod's Diseases of the Skin, Stoddart's Mind and its Disorders, new editions of Aaron's Digestive Diseases, and Binnie's Operative Surgery, &c., also medical stationery and charts. At the same Stand the Cambridge University Press showed Parsons's Isolation Hospitals, Rivers's Instinct, and the Unconscious, &c.; and Maclehose, Jackson and Co. showed J. A. C. Macewen's Text-book of Surgery, and Compound Fractures and Dislocations. At Stand 74 John Smith and Son (Glasgow), who showed a large and classified assortment of medical books from all publishers. The firm, on application at 28, Gibson-street, Hillhead, Glasgow, will send out medical books to practitioners on approval.

(5) SPAS.

The advantages of three of the best known British spas were also displayed at the Exhibition and led to interested inquiry. 15. Droitwich. Full information was supplied concerning the position and climate of these well-known brine baths, the physical and chemical composition of the waters, and the facilities for residence offered. Droitwich is both bracing and sheltered, and these strongly radio-active and emanative waters have been available to many patients for many years in gout and rheumatism, various forms of neuralgia, neurasthenia, and anæmia, and in some cardiac conditions. 49. Bath. The position of the spa in one of the stateliest cities in England dates back, as everyone knows, to Roman times. At Bath, all treatments for which mineral waters are adapted can be obtained, while the waters are drunk in the historic Pump-room or Colonnade Fountain. Apart from acute general diseases, acute phases of tuberculosis and arthritis or advanced cardiac and renal conditions, the waters of Bath are valuable in most pathological states. The numerous manifestations of chronic arthritis in both sexes, of

dysmenorrhœa, early arterio-sclerosis, intestinal stasis, and atonic dyspepsia, are among the distressing conditions for which the medical profession steadily recommends a sojourn in Bath. 59. Buxton is situated 1000 feet above the sea-level and is the most popular mountain spa in England. The waters are radio-active, several of the springs are rich in iron, and the facilities for treatment are elaborate. The corporation has spared no expense in balneological installations, while life in Buxton is made enjoyable. 43. In connexion with spas, at the Stand of Ingram and Royle (45, Belvedere-road, London, S.E. 1), it should be mentioned that specimens of natural mineral waters, salts, and pastilles were shown as prepared for import and export. The firm take a great deal of pains to bring a great variety of continental waters bottled, under guaranteed supervision, to the homes of those who cannot possibly visit the spas.

II. THE SANITARY EXHIBITION.

This exhibition, which was a successful feature of the meeting, grew out of a desire expressed by Sir William Macewen that the Public Health Department of Glasgow should illustrate the directions in which municipal effort tends to further the health of the community. The suggestion was taken up by the Health Committee of the corporation and other committees whose work ran on parallel lines, with the result that many sections of sanitary effort were represented, although it was decided that the illustrations given of municipal activities should be confined to broad outlines.

A healthy community must live on a clean site and one capable of being kept clean, and the Department of Public Works accordingly supplied illustrations of the construction of streets, while the Cleansing Department showed the organisation by which cleanliness is maintained. The methods adopted to protect food-supplies, to cleanse the atmosphere, and to provide baths and wash-houses were all demonstrated, while direct public health machinery was expounded in the exhibits of hospitals, welfare centres, crèches, and tuberculosis dispensaries. The water supply and the methods of transport were also explained, with illustrations giving considerable detail, while perhaps the most significant exhibit of all dealt with the difficult matter of housing.

Photographs of insanitary properties and models of dwellings in overbuilt areas of the city were shown, including back-to-back houses, courts in which the sunlight could never reach the ground floor, and common lodging houses in which space was economised by means of high and low bunks—i.e., the bunk in one compartment was placed above the bunk in the adjoining compartment. In most cases these conditions have now been changed; and one model showed how a tenement with 124 dwellings, built on one-fifth of an acre, had been replaced by a child welfare centre for 30 children. In contrast with these overbuilt areas another section of the exhibition contained plans for Glasgow's housing schemes, in which most of the dwellings were of the modern two-storeyed type, popularly associated with the name of Dr. Addison. Doubtless the difficulties of transport, which are regarded by some authorities as an objection to spreading the areas of towns under these two-storey schemes, will be met by the elaborate system of electric tramways which is one of Glasgow's municipal enterprises, and a section of one of the corporation's well-appointed tramcars was exhibited. The effect of housing conditions on the development of children was illustrated by a series of three plaster casts which were stated to show by comparison the physical condition of children living in one, two, and three-roomed houses—a very striking object-lesson.

The public baths and wash-houses system of Glasgow is very complete, and now comprises 20 establishments with over 1,000,000 attendances a year. The porcelain-lined and covered baths must cause envy in many a small householder; but the Glasgow ratepayer is no doubt relieved to some extent by the charges made for the use of the establishments. These charges seem reasonable; for 3*d*. an hour a woman may obtain the use of up-to-date machinery for washing and drying clothes. We did not learn whether this form of municipal trading is as profitable as Glasgow's tramways are stated to be.

In the section dealing with the work of the chemical laboratories of the city an interesting exhibit was the Glasgow method of inoculating filter-beds with the *Achorates viaticus* for the purpose of cleaning the filtering media. This organism destroys the deposit on the surface of the beds, and thus gets rid of an outstanding difficulty of working biological filters. The method can be adapted to either continuous or localised inoculation. At the same stand Dr. Owens's air filter was shown with graphs indicating the varying intensity of smoke pollution in Glasgow on Sunday and weekdays.

Under the heading of utilisation of waste products a model of the Heenan refuse destructor was shown. The burning of the refuse supplies the energy for the production of electricity. The refuse is collected by vans which are driven electrically by the current thus supplied—an instance of a beneficent circle. A brougham run by the electricity department of the corporation was also exhibited. The clinkers from the destructor are used in various ways, notably for the manufacture of artificial building stone by mixing it with cement, and as material for metalling roads by mixing it with bitumen. Portions of this metalling were shown in which there appeared to be no wear, although they had formed part of a roadway for six or eight years.

In illustration of the various pests dealt with by the Corporation of Glasgow, there were specimens of plague rats, of hymenium spores, and *Merulius lachrymans* from the dry rot of wood, and of various insect pests from dwelling houses.

Lelean's disinfecting sack was also exhibited, a simple, portable, and cheap method for disinfecting clothes and bedding. This invention appears to be extremely effective, and likely to be of great value on ships and to small port sanitary authorities which do not need a complete disinfecting station.

The work of the public health laboratory was made the subject of full demonstration, Dr. R. M. Buchanan, the city bacteriologist being responsible for the exhibit. Specimens illustrative of the work of the laboratory made a very comprehensive range, while the outfits for the transmission of specimens from practitioners to the laboratory were shown, as well as graphs denoting the development of diagnostic work. Lieut.-Colonel R. H. G. Tate was responsible for an interesting display of military sanitation, a feature of which was to provide a full explanation of the water purification methods employed on service. This was a section which appealed with particular interest to the many visitors who on various fronts and in varying circumstances, had found themselves face to face with the problem of how to provide potable water.

We have mentioned a few of the salients in a very interesting and valuable collection of exhibits and demonstrations. The whole story of sanitary progress in a large and progressive city was on show. The housing schemes, the public wash-house arrangements, the methods of drainage, lighting, and water-supply, and the transport. The Corporation is to be congratulated on the evidence provided of the possibilities of municipal enterprise. Dr. A. K. Chalmers, medical officer of the city, has acknowledged publicly the indebtedness of the committee of the exhibition to the various corporation committees, and also to Major-General W. W. O. Beveridge, Director of Hygiene, War Office, and to Lieut.-Colonel R. G. H. Tate, A.D.P. and H., Scottish Command, for arranging the military exhibits.

In a very special way Dr. Chalmers personally thanks Dr. R. M. Buchanan and Dr. R. S. Fullarton for their help in preparing the whole exhibition.

THE LANCET.

LONDON: SATURDAY, AUGUST 12, 1922.

Mental Hospital Administration.

IT is difficult to convince those whose idea of reform is uncompromising, radical, and destructive, that these methods have their own serious dangers. A public prejudice against mental hospital administration has been fostered, and a growing fear as to the fate of friends incarcerated therein has been excited by the publication last year of what has now been proved an exaggerated or, at any rate, an atypical picture of asylum conditions. The report [1] of the committee appointed by the Ministry of Health to investigate the charges made in Dr. MONTAGU LOMAX'S book has now been issued, and its main conclusion is that, in the opinion of the committee, the present provision for the care and treatment of the insane in this country is humane and efficient, and that the personal care of the individual patient compares favourably with that in any other country.

Dr. LOMAX has drawn attention to disadvantages, long known to exist and remediable, but at a cost which few local authorities are prepared to pay. Critics of our mental hospitals must remember that it is the community itself which imposes limitations on the extent to which the efficiency of these institutions can be developed. In practically every aspect of asylum administration criticised by Dr. LOMAX the abuse, where it exists, is dependent on the need for economy in staff or general working expenses. Diet is an obvious example, since though it may be suggested that variation costs no more than monotony, this is only true if the catering department is actively supervised by experts. The committee found meals better served and the general atmosphere more attractive in institutions which provided separate ward dining-rooms in place of a central dining-hall. Again, the employment of patients in the kitchens, the laundries, and the wards is an economy which will not lightly be set aside by local authorities in favour of open-air and congenial occupations; the additional cost of imported skilled domestic labour would be considered prohibitive. We have no wish to condone an undue use of sedatives for patients. Routine prescription of sedatives for restless and excited patients amounts to a confession of failure. In one institution (not named) as many as one-fifth of the patients appear to receive a dose of a sedative every night; but it would not surprise us to hear that the hospital in question has dropped into this deplorable practice on account of the difficulties of obtaining and keeping an adequate staff. This brings us back to the dangers of a ruthless campaign such as the present one against mental hospitals. Clearly, Dr. LOMAX'S book has been widely read in asylums and has created a prejudice among patients which reacts upon the staff. Even supposing study-leave, improved conditions for married men, an increased and better paid medical staff were universally decided on, the attractions of this branch of the medical profession would hardly be great enough to draw the first-rate graduates it needs while the service is being so generally abused. This factor applies with even more force to better-class male and female nurses, who may well be discouraged from entering an unpopular profession or even induced by their friends to leave it. It is not that criticism can or should be stifled. Rightly directed it may lead to provision in the future of more money for reconstruction, for better buildings, and a larger, more specialised staff; but discouragement of the men and women at present trying to make the best of existing conditions by telling them it is impossible to do so can only lead to disaster in the future.

Upon the special points that have emerged from the report there is little to add to previous comments on the subject. * The Ministry of Health Committee crystallise their views of improved administration in a series of recommendations which we print on p. 352. The importance of selecting a suitable medical superintendent, who, it is again acknowledged, must remain responsible for the administrative as well as the medical efficiency of the institution, is manifest. An unfortunate appointment may damage the welfare of patients for a whole generation under present conditions, since the assistant medical officers are naturally chosen on the recommendation of the superintendent. The efficiency of the nursing service is at once the pivot of the whole system of administration and the index of its success. Besides taking steps to attract a better class of probationer, the report suggests that distinction should be made between the two duties of the staff, nursing proper and social duties. If, in the attempt to attract a better type of nurse, the policy is adopted of further shortening hours of work, continuity of treatment may suffer and the social life of the institution may decline. As to the Board of Control, it is recognised that supervision from a strong central authority is needed to prevent abuses. The Board should not be abolished, as some would suggest, but strengthened. Men of sufficient standing and character should be selected as additional members to carry weight when interviewing medical superintendents. But quite apart from staff and central control there is one direction, luckily not a costly one, in which advances may immediately be made. There is no definite evidence that the visiting committees actually visit the mental hospitals in the sense of providing for every patient free access to someone outside the doctor, the clergyman, or the official. The coöption to the visiting committees of members of the local council with some leisure who will frequently visit patients, make friends with them, and patiently hear their grievances, real or imaginary, will be welcomed by the medical and nursing staff, who have little time themselves to devote to the sociological aspects of their work. It will be seen that without amendment of the Lunacy Acts, expressly ruled out of the committee's purview, there is ample scope within their recommendations for salutary change in the whole atmosphere of our public mental hospitals. Stimulus has been given to initiate this change, but an outside atmosphere of hostility and recrimination will only produce the same atmosphere within. What is now needed is constructive effort.

[1] Cmd. 1730. H.M. Stat. Office. 3s.

Residential Treatment of Ophthalmia Neonatorum in the Metropolis.

Two facts came to light at the conference which we briefly reported last week (see p. 291) on the treatment of ophthalmia neonatorum in the metropolis, when representatives of the Metropolitan Asylums Board met delegates from other public bodies interested in the question, in order to discuss the steps that could be taken to ensure fuller utilisation of the facilities for treatment provided by the Board. Each of the two facts brought to light must prejudicially affect

the success of St. Margaret's Hospital, the institution established by the Board for the treatment of this condition, both as a centre for clinical work and for prevention. The majority of the cases of ophthalmia received at the hospital—over 60 per cent. in fact—are gonococcal in origin, and for success early treatment is essential. It is most unfortunate that so many of the children are not brought before serious mischief has developed. Once ulceration of the cornea is present the prospect of even partial success, much less of complete cure, is materially reduced, so rapid are the destructive changes in cases of the more virulent type. The average day of disease on which the children come under hospital treatment at St. Margaret's is the ninth, as against the fifth at Liverpool and certain other large towns. That this should be the case in the provincial towns is, perhaps, not unnatural, seeing that the entire health organisation is under the jurisdiction of one authority, and in effect controlled by a single individual, the medical officer of health; whereas, in London, the cases are drawn from a number of different sanitary areas, each of which is administered by a separate health officer. Uniformity of procedure could, therefore, hardly be expected to the same degree in the metropolis.

Midwives do not seem to be responsible for the delay, their duty being, in cases they attend, at once to call in a medical practitioner at the earliest sign of ophthalmia; that they fulfil their obligations in this respect was attested by the medical inspector attached to the London County Council, and by the representatives of the Central Midwives Board. In many cases the result of investigation showed that the delay in securing hospital treatment was to be laid at the door of the medical practitioner to whom the case had been reported by the midwife. That the doctor in the circumstances should feel that it was his duty to treat the case to the best of his ability is only natural, and in the milder cases such treatment is apt to be followed by results which may quite fairly be regarded as satisfactory. In virulent cases, however, in which destructive changes in the cornea develop with great rapidity, the only chance of saving the sight lies in the application of intensive methods of treatment from the outset. This is practically impossible to secure except the patient be resident in a hospital. Failure to discriminate in the early stage of the disease is largely responsible for the failures. To remedy this unfortunate state of things is eminently desirable, and an attempt to educate the profession at large as to the paramount importance of early hospital treatment in the severer cases would seem to be worth a trial. Some degree of success might be achieved by the medical officers of health circularising the local practitioners in their district.

The second disability, mentioned at the conference, which militates against full use being made of the facilities offered at St. Margaret's is the impression which has, rightly or wrongly, got about, that the institution is one for the treatment of venereal diseases. Primarily, in the interests of the babies, the mothers are strongly advised to enter the hospital themselves for the purpose of suckling them, and a certain number do so. Many, however, are deterred from going in themselves by reason of the supposed venereal stigma. Although the majority of the mothers are infected with gonorrhœa, a good many are not, and a certain number of the infected cases are quite ignorant of their condition. Although the officers of the hospital exercise the greatest discretion in not referring to the venereal aspect of their patients, in circumstances where a number of women have little else to do but sit together and gossip, it is only to be expected that they should discuss the situation and form erroneous impressions. Ideas such as these die hard and are difficult of eradication. St. Margaret's Hospital has only been established about three and a half years, and it is possible that time may bring about a truer understanding. The difficult position cannot be attributed to anyone's fault.

THE VOLUNTARY PRINCIPLE AND THE STAFF FUND.

ALMOST simultaneously with the annual meeting of the Representatives of the British Medical Association, who were arriving at a definition of the voluntary hospital system and discussing the ethics of payment being made to the staffs of such institutions, a conference was being held in London between representatives of the medical staffs of ten of the leading London teaching hospitals, having for its object to register an opinion on the propriety of the foundation of a staff fund.[1] The second of the resolutions arrived at at this conference, which was adopted by seven of the ten hospitals, ran as follows, a substantial dissent in opinion being thus recorded:—

> That when the State, a municipal or other public body pays towards the accommodation, maintenance, and treatment of a patient, or group of patients, in a voluntary hospital, a percentage of such moneys should be allocated to a staff fund.

This resolution should be compared with the following resolution arrived at by the Representative Meeting of the British Medical Association, but not reached until after considerable debate:—

> When the board of management of a voluntary hospital enters into a financial arrangement with a public authority, an employer of labour, approved society, insurance company, or under a contributory scheme or otherwise for the reception of patients, such arrangement should be taken to cover the cost of maintenance and treatment, and a percentage of all such receipts should be passed into a fund which is at the disposal of the honorary medical staff of that hospital.

The strong difference of opinion which was known to exist in staffs of the London hospitals on the subject of the payment of honorary physicians and surgeons was thus reflected at a conference of speakers who were charged to register the views of medical men working at voluntary hospitals in various parts of the kingdom. It is impossible not to feel sympathy with the minority who are clinging to worthy ideals, and whose attitude is entirely for the public good. At the back of their action is the principle that as long as medical services are voluntary those who offer them have a position from which to advise the lay management of hospitals as to what class of case is suitable for admission not only on medical but also on financial grounds. But certainly in many parts of England the principle of a staff fund has already been accepted.

[1] See THE LANCET, July 29th, 1922, p. 244.

SOUTH AFRICAN COUNCIL OF PUBLIC HEALTH.—The following have been appointed by the Governor-General of the Union of South Africa as members of the Council of Public Health, under Section 4 of the Public Health Act of 1919, for a period of three years commencing July 1st, 1922: Dr. Charles Porter, Dr. Servase Meyer de Kock, Dr. Ernest Hill, Dr. David Pieter Marais, Dr. Paul D. Cluver, Mr. Joseph Henry Nicolson, O.B.E., J.P., and Miss Mabel Elliott.

INTERNATIONAL CONFERENCE OF MEDICAL WOMEN.—A Conference of medical women of various nationalities will be held at Geneva during the first week of September. This is the second occasion on which medical women from various parts of the world will have met together, the first meeting having been held in New York in 1919. The authorities of the University of Geneva have promised accommodation for the meetings of the Conference, whereat many subjects of international medical importance will be considered. The members of the Conference will be invited to place the constitution of the International Medical Women's Association on a permanent basis. The proceedings will begin with an inaugural banquet on Sept. 4th and will last for four or five days.

Annotations.

"Ne quid nimis."

EPIDEMIC DIARRHŒA.

DURING the last July week 11 children under 2 years of age in Greater London, and 38 in the 105 great towns of England and Wales, died from diarrhœa and enteritis. During the same week 6 deaths in Glasgow were attributed to the same causes and one each in Dundee and Aberdeen. The total fatalities were fewer than in the hotter week immediately preceding and much fewer than in the corresponding week of last year. In an original article which appears this week in our columns, Dr. Donald Paterson tells us that 147 cases, diagnosed as summer diarrhœa, were admitted during the hot months of 1921 to the Hospital for Sick Children in Great Ormond-street. Of these less than one-half were discharged cured. Whatever may be the tendency to a reduction in the number of cases of this disease, it is evident from the case mortality that summer diarrhœa when it occurs remains extremely grave. Dr. Paterson writes of the ætiology of the disease as still in doubt, especially in regard to the part which bacteria play on the food before or after ingestion. He quotes with approval C. E. Bloch's observation in 1920 that, whether pathogenic bacteria are or are not found in the stools, the clinical picture, pathological findings, and epidemiological course of the disease are much the same. Dr. David Nabarro contributes a report on 41 fatal cases which were examined bacteriologically during life, or after death, or both. After the common *B. coli* the organism most frequently isolated was *B. coli anaerogenes*; in addition to the 12 fatal cases it was found also in several cases which recovered. *B. dysenteriæ* was isolated from four cases, *B. paratyphosus* B from two, and in no case was Morgan's No. 1 bacillus discovered. Study of ætiology has not yet thrown light on treatment which remains much as it was. Removal of the child from the environment in which it contracted the disease into a bed surrounded by fresh moving air; administration of saline to make up loss of fluid, apparently best given intraperitoneally when symptoms are urgent; strong glucose solution by the mouth, as being eagerly taken and containing a larger number of calories than other food equally bland—these are the measures approved by experience. No medicinal remedies appeared to influence appreciably the course of the disease.

We may still hope that some more effective way may be found of treating this summer scourge of our large towns. The helplessness of medicine in face of the severely toxic and dehydrated child makes prevention of the disease worthy of every kind of effort. In his annual report for 1921 on the great urban area for whose public health he is responsible, Dr. W. H. Hamer has a paragraph of great interest on the epidemiology of diarrhœa and enteritis, and it is fortunate to have his experience now that we are approaching the usual time of maximum incidence. During the whole of last year 2152 children under 2 years of age died in London from diarrhœa and enteritis, giving a mortality rate per thousand births of 21·55, slightly below the average for the ten years 1911 to 1920. It is well known that Ballard found in 1885 that when the 4 ft.-underground temperature reaches 56° F. diarrhœa commences. In view of the high average temperature of last summer, Dr. Hamer finds the mortality from diarrhœa remarkably low. In a diagram in his report the relation between summer diarrhœa and temperature is shown graphically, and for the 38 years up to 1914 the agreement between the two curves is very remarkable. From 1914 on, however, there is a remarkable difference between the actual mortality and that estimated as probable from the summer temperature. Dr. Hamer gives his reasons for thinking that this is not, as might appear, entirely an effect of the war, but rather the accentuation of a tendency already noticeable in pre-war years. Separation allowances combined with food rationing certainly did improve the quality and even the quantity of food supplied to the very poor, the class in which mortality from infant diarrhœa is greatest, and the special administrative measures directed towards the care of expectant and nursing mothers as well as of their infants, inaugurated before the war, continued to develop in spite of war conditions. Over and above these direct influences Dr. Hamer sees another modifying factor—in the effect of national health insurance in bringing the medical practitioner into closer relation with the homes of the poor. However the beneficent result is to be explained it is a fact that the peak of the mortality curve, usually a fortnight or so behind that of the temperature, has recently lagged as much as seven or eight weeks. Diarrhœa occurring so long after the crest of the heat-wave is less deadly. Increase in the lag commenced about the time of the commencement of the decline of infant mortality generally, and cannot, in Dr. Hamer's view, be explained by differences in classification. Infants born since 1900 really seem to have been rendered more resistant and to possess increased power to withstand the strain of abnormal conditions. Decrease in the amount of horse manure on the streets may well have been a contributing factor. The gradual decline of diarrhœa is one of the best examples of the effect of providing a sanitary environment.

THE NEW YORK LIFE EXTENSION INSTITUTE.

THE Life Extension Institute, Inc., was founded in 1914; its aims were described[1] as the lengthening of human life and the increase of individual human efficiency—aims which it was proposed to attain by the appointment of expert medical examiners, with fully equipped laboratories in all the larger centres of population, who would periodically examine the physical condition of its own policy-holders, of policy-holders of other life insurance companies contracting with it for the purpose, and, on payment of a small fee, of any other person who might desire it. Schools, industrial establishments, and health authorities were also to be contracted with, and the Hygiene Reference Board of the Institute contained many names well known in medicine. A report on the past year's working has recently been issued in the form of a letter to the members of this Board, in which the Institute claims to have made substantial progress in its work, although the business depression in 1921 was felt to some extent. The insurance work of the Institute is double its volume a year ago; seven insurance companies are served by it, and others are contemplating contracts. This is stated to be largely the result of the statistical study made by the Metropolitan Life Insurance Company, showing a reduction in mortality of 28 per cent. among the policy-holders tabulated (those examined by the Institute in 1914 and 1915), and a reduction of 67 per cent. in the mortality among those found impaired. The company states that this has been a 200 per cent. investment (returns $2 net profit for every dollar expended), "thus demonstrating the fundamental sanity of the Institute's insurance program and evidencing the tremendous future possibilities of the work." Many inquiries have been received from scientific men and health authorities abroad asking for details as to the work of the Institute.

A notable piece of work conducted by the Institute in 1921 was the investigation of ill-health as a cause of waste in industry, on behalf of the Federated American Engineering Societies, under Mr. Hoover. The full report of this investigation has been amplified into a book entitled "Health Building and Life Extension: A Discussion of the Means by which The Health Span, The Work Span and The Life Span of Man can be Extended," written by Dr. E. L. Fisk, medical director of the Institute, to be published shortly. Much information on health conditions

[1] THE LANCET, 1914, i., 1199.

drawn from scattered sources has been assembled, systematised, and discussed in this book. Another educational effort of the Institute, a volume prepared by Dr. Fisk in the "American Viewpoint" series, will contain a simple story of health and hygiene, and information as to governmental health organisations, for the education of immigrants, school children, industrial workers, and that portion of the public which welcomes information presented in a simple and pictorial form. A moving-picture series has been planned to present the material in this work and to make available a film library of simple, fundamental health instruction. An unpaid examination of 100 Post Office employees revealed that 12 per cent. of these men were in need of some form of medical attention. On the basis of this study the coöperation of the United States Public Health Service was secured, and 1000 Post Office employees were examined; the report on this inquiry is not yet published. Plans are nearing completion for turning over as a free gift the common stock of the Institute to several leading Universities, and the ultimate retirement of the preferred stock, thus placing the final control of the Institute in the hands of the trustees of these Universities, who will be able to safeguard it in the distant future for such work as it can best perform. At its New York office the Institute employs a staff of about 30 physicians, whole-time and part-time, and 120 technicians and lay employees. Consulting specialists work with the regular staff. The Institute has referred its examinees to their family physicians for medical treatment which, at an average rate of medical charge, would represent fees amounting to between five and ten millions of dollars. The Institute does not practise medicine. No dividends have yet been paid; the President of the Institute, Mr. H. A. Ley, gives his time without salary. A note is added to the report, to the effect that neither the medical director nor any member of the staff hold any stock of the Institute or derive any emoluments from it other than moderate salaries.

THE RÔLE OF THE PROSTATE IN URINO-GENITAL TUBERCULOSIS.

NOT long ago tuberculosis of the prostate was commonly regarded as a rare and comparatively unimportant condition, of far less importance than tuberculosis of the epididymis. Thanks to the investigations of Simmonds of Hamburg and other pathologists, this mistake has been corrected, and it is now generally admitted that the prostate plays a most sinister part in conveying tuberculosis from the urinary to the genital system. This teaching is confirmed in a recent paper by Dr. P. J. Schultz[1] of the Pathological Institute of the Berlin-Moabit Hospital. Among 14,086 necropsies performed between April 1st, 1908, and April 1st, 1920, he found 125 cases of genital and urino-genital tuberculosis in the male. In as many as 104 cases the prostate was involved, the vesiculæ seminales taking second place with 78 cases, and the epididymis third place with 66 cases. In 35 cases the prostate was the only gland in the genital system to be involved, and in 23 of these cases both the urinary system and the genital system were in other respects intact. The prostate, in other words, would seem to have been infected by the blood-stream in these 23 cases. All the 125 cases were associated with tuberculosis elsewhere, and with few exceptions, the lungs and pleuræ were also the seat of tuberculous changes. Isolated "genito-primary" tuberculosis of the epididymis proved to be exceedingly rare and only four such cases were observed; in a fifth case the epididymis was the only structure in the genital system affected by tuberculosis, but in this case renal tuberculosis was also found. The question with which Dr. Schultz was largely concerned was the comparative importance of "testipetal" and "testifugal" infection. He has come to the conclusion that, in the overwhelming majority of cases, the genital system becomes infected by the prostate; that "testipetal" spread of infection is, in other words, the rule and not the exception. Without this gland, which forms a connecting link between the urinary and the genital systems, men would suffer as seldom from tuberculosis of the epididymis in conjunction with renal tuberculosis as women suffer from tuberculosis of the Fallopian tubes in conjunction with renal tuberculosis. An important conclusion to be drawn from this paper is that, in one respect at any rate, tuberculosis of the kidneys is fraught with greater danger to men than to women.

[1] Zeitschr. f. Tuberkulose, 1922, Bd. xxxvi., Hft. 2.

THE WELFARE OF THE DEAF.

A SPECIAL appeal has recently been issued by the National Bureau for Promoting the General Welfare of the Deaf. Since its foundation in 1911, the Bureau has helped to coördinate the numerous organisations for the deaf. It has brought together for purposes of discussion many persons interested in all aspects of their welfare, and has collected and classified information, maintained a valuable library, and answered many inquiries relating to such varied matters as lip-reading, employment, electrical aids, private and public schools for deaf children, higher education for the deaf, and how to deal with quacks. It has provided information for Government Departments and public authorities. The Bureau drew public attention to the causation and prevention of deafness by means of a series of lectures—delivered in 1912 by Dr. J. Kerr Love, and later issued in book form—which constitute an indispensable basis for further research, and has also published a useful and much-needed handbook of information relating to the deaf, the only work of its kind available. Immediately before the war the Bureau brought together a representative gathering in order that a practical scheme might be formulated for the foundation of a National Training College of Teachers of the Deaf. The war prevented further work on this scheme, but it may be said that the foundation of the present Chair of Deaf Education, at Manchester, by the late Sir James E. Jones, was largely due to this movement. The war left the Bureau in a condition described in the appeal as one of "partial functional paralysis." There is ample provision for the education of deaf children in the 51 day and residential schools established throughout the country by private philanthropy, or by municipal and county education committees, but much remains to be done with regard to school attendance and to the evolution of the best teaching methods. There is no general provision for suitable education or technical training of the adolescent deaf, whilst the work for the adult deaf everywhere languishes for want of public support. An organisation such as the National Bureau is, therefore, required to coördinate isolated effort, to bring together agents and interested people for concerted action, and to carry through a national policy. The appeal is signed by Mr. Macleod Yearsley (Acting Chairman of the Bureau) and Messrs. G. Sibley Haycock, Arthur J. Story, and Albert Smith, who express the opinion that the future functions of the Bureau should be briefly as follows: (1) assistance and education of the adolescent deaf by getting into touch with the various schools and societies, and by conference and otherwise seeking to unify their experiences and results; (2) continuance of the work of coördination and of general assistance to the deaf in which it has been so successful in the past, with the creation of an efficient publicity department; (3) institution of a medical department which should (*a*) stimulate prompt and efficient treatment of children deaf or threatened with deafness, in the pre-school period as well as during the scholastic age, and (*b*) promote and assist by all means in its power the studies of causation and prevention; (4) institution of a political department to urge the earlier education of deaf children and their higher education after the age of 16, and establishment of a college or colleges for higher education or technical training

in Great Britain, analogous to those already existing for the deaf in the United States and for the blind in England; (5) a legal department, controlled by a solicitor, to provide expert advice with regard to legislation and other matters. A questionnaire is appended to the appeal, asking for information under five headings: (1) as to whether the reorganisation of the Bureau on the lines indicated would meet with support; (2) as to the constitution of a council to include representatives of teachers of the deaf, of missions and after-care organisations, of the medical profession, and of those whose work is the training of teachers, with the possible addition of others connected with public life and industry; (3) as to the increase of the income of the Bureau from under £400 per annum to a necessary minimum of £1000; (4) as to the existence of any funds which might be devoted to the uses of the Bureau; and (5) as to the existence of persons, societies, or organisations interested in the deaf or likely to assist the Bureau financially. It is hoped that replies will be received from the authorities who have been circularised before October 31st of this year, in order that the work of reorganisation may not be delayed.

THE EFFECTS OF SALINE PURGATIVES ON THE ABSORPTION OF OTHER DRUGS.

IT is well known that saline purgatives act chiefly owing to the poor absorbability of certain ions—e.g., those of magnesium sulphate and phosphate; the osmotic action of the unabsorbed salt, which draws fluid into the intestinal lumen, leads to the accumulation of fluid in the intestinal canal. D. I. Macht and E. M. Finesilver [1] have investigated what effect the administration of such purgatives may have upon the absorption of other drugs given by the mouth simultaneously or a little after the laxative. Experiments were made with phenolsulphonphthalein, a drug rapidly absorbed and excreted by the kidneys. To dogs a solution of this drug was given by stomach-tube and the amount excreted in the urine hour by hour determined. Several days after the drug was completely excreted, the drug was again administered, but this time mixed with a 5 per cent. solution of sodium sulphate and the amount and rate of excretion by the kidneys determined hourly. It was found that the excretion of the phenolsulphonphthalein was markedly delayed by the simultaneous or previous administration of sodium sulphate, and the same was true of magnesium sulphate and other saline purgatives, but no such effect was produced by the administration of cathartics of a non-saline character, such as castor oil or cascara sagrada. In the method employed to study the mechanism of absorption cats were anæsthetised, the abdomen opened, and two loops of intestine of the same length tied off; into one a standard solution of the coloured drug with a given volume of water was injected, and into the other loop the same amount of the dye was placed mixed with sodium sulphate solution and the abdomen closed. At the end of an hour the animals were killed, the loops excised, and the contents measured. In the control loops—i.e., those with dye and water, much of the fluid had disappeared, while sometimes 60 per cent. of the dye had been absorbed. In the saline-dye loops the volume of fluid was greatly increased, while over 90 per cent. of the dye was unabsorbed. Representatives of other classes of drugs were tested—e.g., digitalis, various antipyretics, such as salicylates, acetanilid, antipyrine, urotropin, iodides, opiates, various alkaloids, bichloride of mercury. It was found that almost every kind of drug examined was delayed more or less in its absorption by the previous and even by the simultaneous administration of saline laxatives. These results are of some interest in connexion with chronic constipation amenable to saline purgatives. Careful spacing in the administration of salines between meals is desirable in order not to interfere with the assimilation of other substances.

[1] Soc. for Expt. Biol. and Medicine, vol. xix., April, 1922.

BIOLOGY AND THE KINEMA.

ON August 3rd, at the private theatre of Goldwyn, Ltd., 12, Great Newport-street, London, W.C., a private view was given to officials of various Government departments and others of several reels from a series entitled "The Science of Life," which represents the latest educational kinematographic work of the Bray Productions Corporation, New York. The "Science of Life" series is described as "a thirteen reel motion picture course of instruction, produced under the direction of the Surgeon-General of the United States Public Health Service." Five reels were shown, the first and second being illustrative of general biology, and dealing particularly with the lowest forms of life. The movement, irritability, and processes of assimilation and reproduction of *Amœba*, *Stentor*, *Paramœcium*, and *Hydra*, together with the structure and sexual life of flowers, were made clear, partly by the actual combination of microscope and kinema camera, and partly by excellent simple "animated" diagrams. Reels 8 and 9, showing the life-histories of the mosquito and house-fly, and their methods of spreading disease, should be valuable for purposes of public health. The diligence which went to the making of these very fine pictures is typified by the fact that the biologists who took the mosquito reel watched for 72 hours in order not to miss the moment when the anopheles larva broke out of its capsule. Reel 10, illustrative of the "Personal Hygiene" section of the series, was devoted to sex education for boys and men; it suffered from lack of cohesion, or possibly from large "cuts" in the original production. The attention of the audience was whisked to and fro amid such items as: an athlete hurling the javelin; Theodore Roosevelt talking on his verandah, and a photograph of Abraham Lincoln—these last two subjects being illustrative of virility; a warning as to the power of the sex impulse; a rider controlling a bucking horse—this scene being apparently intended to typify the difficulty of mastering that impulse; a brief reference to the ductless glands; a diagram of the male genital organs; a reassuring observation concerning nocturnal emissions; various staccato statements relating to venereal diseases and their effects, with "close-ups" of *Treponema pallidum* and gonococci (if the term employed for the well-known means of registering facial expression may be applied to portions of film exposed through the microscope); cases of locomotor ataxia and congenital blindness, and one glimpse of a mentally deficient child. If this reel is for adults only its excellent purpose would bear a starker interpretation. If it is intended to be shown to children, it should be less confusing. There would be more propaganda in two minutes' projection on the screen of the *Sydney Bulletin* cartoon to which we referred a month ago[1] than in the quarter of an hour or twenty minutes occupied by this portion of the "Science of Life." From the examples shown the whole series is so excellent that it is a pity the level should not be maintained throughout.

A SIMPLIFIED SYSTEM OF ACCOUNTS FOR SMALL HOSPITALS.

ECONOMY combined with efficiency is the touchstone of all successful hospital management, whether the institution be large or small, and a uniform system of keeping accounts such as that devised by King Edward VII. Fund, known as the R.U.S.—Revised Unit System of Hospital Accounts—affords a very practical means of enabling hospital managements to compare their maintenance expenses with those of hospitals of similar size and range of cases, with a view to seeing where economy can best be carried out. But this system is more particularly adapted to large hospitals, and as was pointed out by Lord Cave and emphasised by Lord Onslow, the chairman, and other speakers at the recent National Conference of Local

[1] THE LANCET, July 8th, 1922, p. 75.

Voluntary Hospital Committees, there is a great need for a simplified and uniform system of keeping accounts where small local hospitals are concerned. To meet this need recommendations have been made by the Voluntary Hospitals Commission which has now issued a report (V.H.Cmn. 7) from the office of the Ministry of Health. It urges those hospitals which can do so to keep the R.U.S., but cottage and other small hospitals which are unable to keep the R.U.S., owing to lack of a paid clerical staff and for other reasons, are urged to keep a simple cash account which is given as an appendix to the report in question. An equally simplified summary of assets and liabilities is provided for where a balance-sheet is not practicable. The headings of the cash account approximate to those which appear in the R.U.S., the Commission having, with the permission of the King's Fund, adopted suggestions of the Fund, which has been engaged on similar work to that of the Commission in regard to the simplification of hospital accounts. For the guidance of hospital treasurers who are not familiar with the R.U.S., the King's Fund are arranging to publish an index which will show at a glance to what heading any particular item of expenditure should be charged. In future, it is suggested, no hospital should be recommended for a grant unless the committee of management undertake to keep such form of account as the local hospital committee may require. Copies of the account, together with instructions for keeping it and of the index referred to, will be obtainable either from the King's Fund Publisher, Mr. George Barber, 23, Furnival-street, Holborn, London, E.C. 4, or through any stationer. The price of the accounts is 1*s.* 7*d.* post free, and that of the Index of Classification 1*s.* 2*d.* post free.

A STANDARD FOR CONDENSED MILK.

IN moving the second reading of the Milk and Daries (Amendment) Bill in the House of Commons the Minister of Health called attention to the power which Clause 8 proposed to give him to prevent danger to health from imported milk, but he went on to add that condensed milk fell under another category, as the question of standard was rather one of food value than of purity, and he hinted that regulations might be set up with a view to the rejection of milk not up to the proper standard. A day or two later Mr. Grattan Doyle asked the Minister whether he could not make it obligatory to label separated milk on the containers as "skimmed milk unfit for infants" in accordance with Dr. F. J. H. Coutts's recommendation of many years ago. In his latest report to the Sanitary Committee of the City of London, Dr. W. J. Howarth quotes the impression that condensed milk, now imported from abroad, is not on the whole of such good quality as prior to the war. The results of an analysis recently made by the City analyst show that the percentage of fat in the 13 samples of sweetened whole-milk examined varied from 6·45 to 9·35; in two unsweetened whole-milk samples the corresponding figures were 7·7 and 8·25; these figures comparing unfavourably with those found by Dr. Coutts in 1911. Dr. Howarth calculates that the amount of milk fat in ounces, purchasable by a unit of 100 pence, in the sweetened whole-milk supplied in tins, varies between the wide limits of 9·02 and 16·42. He finds it difficult to believe that the difference between 9 and 16 in unit value can simply result from commercial methods adopted in preparation and distribution. His solution is to require a standard of 9 per cent. of milk fat to which manufacturers should work. One part of such condensed milk diluted with two parts of water would then give a fluid milk complying with the present milk-fat standard of raw milk. In common with other health officers he also asks that the conditions regulating the sale of skimmed milk should be altered to the extent of requiring that the label should bear, in letters prominently displayed in a contrasting colour, a statement to the effect that the tin contains skimmed milk and that such milk is not fit for the food of infants.

EXAMINATIONS IN DENTISTRY.

WE have received from Mr. Norman King, the Registrar of the Dental Board of the United Kingdom, the following table of the results of the first series of

Tabulated Results of the Prescribed Examinations in Dentistry held during July, 1922.

		Manchester.	London.	Edinburgh.	Total.
Mechanics failed.	Candidates	38	52	21	111
	Passed	31	39	16	86
	Part I.	2	7	—	9
	Part II.	4	3	5	12
	Parts I. and II.	1	3	—	4
Practitioners failed.	Candidates	13	37	5	55
	Passed	6	30	5	41
	Part I.	1	2	—	3
	Part II.	4	4	—	8
	Parts. I. and II.	2	1	—	3
W.S. candidates.	Candidates	14	45	9	68
	Whole exam.	8	32	7	47
	Part I. only	4	5	1	10
	Part II. only	1	4	—	5
	Failed	1	4	1	6
Total failed.	Candidates	65	134	35	234
	Passed	45	101	28	174
	W. S. candidates for re-examination	5	9	1	15
	Part I.	4	13	—	17
	Part II.	12	12	6	30
	Parts I. and II.	4	8	1	13

examinations which took place last month. Part 1 of the examination includes the written paper and the oral and Part 2 the Practical Examinations in Operative Dentistry and Dental Mechanics. It is interesting to note that the majority of those who failed did so in Part 2, which included the subjects in which they claimed to be proficient, and not in Part 1 with regard to which greater anxiety was displayed by the majority of the candidates.

AN OCULAR SIGN OF SYPHILITIC INFECTION.

AT a recent clinical meeting of the Child Jesus Hospital at Warsaw, Dr. A. Chelmonski[1] read a paper in which he described and demonstrated with his patients what he claims to be a new sign of syphilitic infection. Having remarked something unusual about the expression in the eyes of his tabetic patients, Dr. Chelmonski decided to analyse this expression and determine, if possible, its significance. At first he thought it might be due to the failure of the pupils to react to light, but this hypothesis had to be abandoned when he made the further observation that the same expression was characteristic of primary and secondary cases. A careful examination of the peculiarities of these abnormal eyes revealed the following characteristics. Pupils which react somewhat more sluggishly than normal both to light and to accommodation; sometimes an oval outline; the tracery of the iris is smudged, often unequally, in the two eyes and the iris appears to have lost both colour and lustre, the latter because the anterior chamber is often extremely flattened. The optic disc is pale and the vessels of the retina may appear narrowed. Of these characteristics the most constant are the smudging of the iris and the diminished reaction of the pupils to light and accommodation. When one remembers how frequently the spirochæte is localised in the iris it is not astonishing to learn that a change may occur here with some regularity. If, as Dr. Chelmonski claims, regular anatomical and functional changes lead to a more or less typical expression whereby they may be recognised, the practitioner would have occasion for rejoicing. This was a theory current in the days before laboratory aids to diagnosis were recognised, when observation and analogy were the principal tools in

[1] Revue de Médecine, 1922, No. 3, p. 172.

the practitioner's hand. There is a reaction from too implicit reliance on laboratory methods, but we must beware lest it carry us too far.

AN OUTBREAK OF LEAD POISONING DUE TO BEER.

DURING last month a considerable number of cases of lead poisoning occurred in certain districts of Middlesex, which were traced to the consumption of beer supplied by a particular firm of brewers. A medical practitioner in one of the affected areas promptly recognised that an outbreak of lead poisoning was occurring amongst his patients and at once notified the medical officer of health. The latter found that the outbreak, which was fairly widely spread in his district, was limited to persons resorting to certain public-houses in the cellars of which large iron tanks, lined internally with white enamel, had recently been provided for storing the beer. Samples of beer from these public-houses were taken for analysis and were found to contain about one grain of lead per gallon. The beer as it left the brewery was ascertained to be free from lead. It was discovered that a lead glaze had been used in the preparation of the enamel and that from this source, by means of the plumbo-solvent properties of its sugars, the beer became contaminated. The use of these tanks was at once discontinued by the brewery company, thus cutting off risk of further danger from this source. The persons affected had drunk the beer containing lead for some two or three weeks before the cumulative effect of the poison produced the characteristic signs and symptoms. These included colic, constipation, jaundice, and blue line on the gums.

The attention of medical men in the Middlesex area is called to these facts for it is probable that cases of lead poisoning, ascribed to unknown causes, have occurred among persons frequenting public-houses in which the contaminated beer was supplied, but who resided in other districts. Possibly also anomalous cases of illness have been encountered by medical men in or near the districts in which the public-houses in question are situated, which may have been instances of lead poisoning. During the investigation it was found that another brewery company had substituted tanks for barrels in their public-houses, but in this instance the tanks were of earthenware lined with leadless glaze, and no lead was found in samples of beer taken from them. The occurrence is a good illustration of the value of prompt action on the part of practitioners in reporting to the medical officer of health cases of illness which may be due to the contamination of articles of food or drink. It is of equal importance that in such cases the medical officer of health should in turn promptly inform the Ministry of Health of their occurrence. Causes operating simultaneously in widely separate districts can be expeditiously dealt with only by a central authority.

THE death has been announced on August 4th of Mr. A. Marmaduke Sheild, consulting surgeon to St. George's Hospital.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—As already announced, a two weeks' post-graduate course in general medicine will be held from Sept. 11th to 22nd, the following hospitals participating: Hospital for Consumption, Brompton, Hospital for Epilepsy and Paralysis, Bethlem Royal Hospital, National Hospital for Diseases of the Heart, Middlesex Hospital, St. George's Hospital, the "Children's Clinic," Western General Dispensary, and the Royal Eye Hospital. The syllabus giving full particulars can be obtained from the secretary to the Fellowship at 1, Wimpole-street, London, W.

A short course on Common Tropical Diseases will be held at the School of Tropical Medicine, Endsleigh-gardens, in October next. It will consist of systematic lectures, illustrated by clinical demonstrations, on the pathology, symptoms, diagnosis and treatment of the several diseases and their sequelæ. Copies of a preliminary syllabus can be obtained from the secretary to the Fellowship of Medicine, and the detailed programme will be issued later.

PSYCHO-ANALYTICAL SCHOOLS OLD AND NEW.

BY J. ERNEST NICOLE, L.M.S.S.A. LOND.,
ASSISTANT MEDICAL OFFICER, LANCASHIRE COUNTY ASYLUM, PRESTWICH.

NOWHERE is the saying, "so many men, so many minds" more true than when applied to the more recent developments of psycho-analysis. The rapid extension of the psycho-analytical method of investigation in medicine, pure psychology, and philosophy has led to a mass of conflicting views, theories, and interpretations. Moreover, as an only too frequent result of this complication—a complication not only based on opposed conceptions but also on misunderstanding of terms—we find one particular view or theory made the cause of wholesale condemnation of all the various schools of thought that may broadly be described as psycho-analytical.

Towards the end of last century the way was paved for psycho-analysis by the work of P. Janet and the French school in their conception of an unconscious which contained Janet's "parties inférieures," together with the theory of disassociation. While progress was thus being made in medical psychology, the philosophers were equally busy with the study of the unconscious, as shown by the voluminous writings of E. von Hartmann on the subject; but it fell to the lot of medical men to develop a working theory of the unconscious, based on the study of neuroses, more especially hysteria.

Breuer.

J. Breuer was the Viennese physician with whom Freud was at first associated. His investigations of hysteria revealed to him the presence in the past of a psychic trauma, often of a sexual nature, as a cause of functional disorder; and he found, too, that what would have been the normal expression of the emotional affect of the trauma did not at the time take place, being suppressed instead, and subsequently giving rise to a neurosis. To cure such a condition he hypnotised the patient, and got him or her to recall the details of that past trauma and allow the expression of its accompanying affect. The harmful effect was thus worked off, or "abreacted," to use the term coined by Breuer himself. He found also that some of the aspects of that trauma were not easy to recall, and this he ascribed to the patient's attempt forcibly to forget a situation that had proved painful and difficult.

Freud.

S. Freud soon parted company from Breuer, first because he saw a far wider application of sexual factors as a cause for neurosis than Breuer was prepared to admit, and next because he denied the necessity of a hypnoidal state for reassociating the suppressed material to consciousness; for the old method of hypnosis he substituted that of "free association of ideas." The study which he made of his patients' deeper mental layers led him to call his method psycho-analysis, and to evolve the following views:—

The Unconscious.—The unconscious is that part of the mind which contains memories which cannot be recalled by any ordinary means of introspection. The forgetting of these mental contents is an active process of relegating to the unconscious what is unpleasant or painful, this forgetting being termed "repression." The repressing force is the "endo-psychic censor," and the repressed material is primitive and anti-ethical. Further, this repressed material is ever striving for recognition in consciousness, and between it and the censor a conflict is established. Normally, this conflict is resolved by the repressed material finding expression in new paths which are ethical and admissible though still psychically related to the older forbidden ones, this conversion of expression from a non-permissible to a permissible form being

termed "sublimation." If the conflict with the censor be too great, because the repressed trends are too strong or the sublimation inadequate, then the result will be either a dissociation of personality or the bursting forth of the repressed material in a disguised and pathological form constituting a neurosis. These repressed trends and memories are all, according to Freud, the direct or indirect derivatives of the sexual instinct, the instinct which is most "censored" by our education and conventions. "Sex" is used by him to connote all the aspects of love and of its derivatives.

Direction of Love Tendencies.—In the early stages of infantile development, sexual interest has for its first object the individual's own person; thus the growing child's first love is himself. The love tendencies are next directed towards the parents—often admixed with love's polar opposite, hatred—then a little later exclusive affection is poured upon members of the same sex but outside the family, and finally the other sex becomes the recipient of fully developed love. Each of these successive stages requires a repression of the tendencies of the preceding one with a corresponding sublimation, and if at any point development be arrested, a "fixation" results. The individual may thus never get beyond the self-love or "narcistic" stage; or else exclusive love for one parent—mostly the one of the opposite sex—becomes the keynote to character. This love, exclusive love, for one parent is, in so far as it is love, incestual. When occurring from a boy to his mother, the fixation is known as the œdipus complex, and if from a girl to her father, the electra complex. When, on the other hand, this stage is successfully passed through, then arrest may take place when all love interests are centred in other members of the same sex, thus giving rise to a homosexual complex. These complexes, when constituting a fixation, act from the unconscious, and their owner is not consciously aware of the vast influence which they have upon his subsequent adaptation.

Causation of Neuroses.—A neurosis is thus caused by a sudden trauma which so upsets the patient's mental balance that any repressed and infantile sexual trends or "wishes" which constituted a fixation and were striving for recognition at last break through the repressing forces and find a distorted expression in the neurotic symptoms. Since these neurotic symptoms are the disguised expression of repressed trends, then the cure of the neurosis will consist in putting an end to the repression by bringing to the light of consciousness this hidden material. The main method of thus tapping the deeper layers of the mind is, apart from "free association of ideas" by the patient, the collecting of associations on the contents of dreams. The language of dreams is—as are also, to a lesser extent, the neurotic symptoms themselves—symbolic, and capable of translation. Thus the "obvious" dream content is based upon the "historical" content consisting of images of some of the experiences of the previous day, these images being selected on account of their having a symbolic relationship to the hidden or "true" content. This last is thus a pictured representation of the repressed and unconscious material debarred by the censor from entering consciousness undisguised; hence the use of symbolism. The meaning of these symbols are elucidated not only from the patient's own associations, but also from a study of general symbolism as found in fairy tales and myths. Freud's interpretation of dreams is therefore causal and by referring to past events as a cause is entirely "reductive," being based on a dynamic conception of the unconscious "wish."

Freud's theories have been endorsed and further elaborated by K. Abraham, A. A. Brill, P. Bousfield, I. Coriat, J. C. Flugel, S. Ferenczi, D. Forsyth, H. W. Frink, E. Jones, S. E. Jelliffe, W. Lay, B. Low, O. Rank, H. Sachs, H. Sommerville, W. H. Stoddart, W. White, and others, though the disciples have unfortunately often failed to preserve as open a mind towards opposing views as their master.

Adler.

A. Adler, one of Freud's first pupils, made his name by his work on "organ inferiority and its psychical compensation." According to him, neuroses are due to some physiological deficiency and the neurotic symptoms arise as a mental defence against physical inferiority. But here he leaves Freud and calls his psychiatric method and views "Individual Psychology." He refuses to interpret the mechanism of psychical compensation in terms of the sex-instinct, and cannot admit that neuroses are only the result of past motives now unconscious and serving no definite purpose. On the contrary, he believes that "we are what we are" not because "we have been what we have been" as Freud would put it, but because "we would be what we can't be." In other words, neurosis is not the mere result of past mistakes but has a direct relationship to our aspirations for the future; Freud looks back where Adler looks ahead. These aspirations towards the future are not sexual at all but egoistic, and their manifestations, which Adler calls "masculine protest," correspond to Neitzsche's "will to power," itself a derivative from the "will to live" of Schopenhauer.

Freud does not deny the ego-instinct, but he gives it scant recognition: most of its expressions he reduces to sexual terms, making the ego-instinct a derivative of, or at least a vassal to, the sex-instinct; indeed, he rather looks upon the self-regarding sentiment as a form of self-*love*. But to Adler, who regards the ego-urge as a much more primitive instinct than the sexual one, all sexual trends are means of expression of the "will to power."

Whereas Freud considers the neurosis as a *withdrawal* from reality into the phantasies of earlier and unsatisfied sex interests the value of which has persisted owing to a fixation, Adler sees in the neurosis a *defence* against reality, an attempt at obtaining power and security over an actual or pending inferiority. The dream to him is, therefore, not the fulfilment of an infantile wish, but is a means of securing a sense of power, and an attempt at solving the ever-recurring problem of inferiority; repeated dreams of a constant nature he holds to represent the course followed by fictitious guiding lines—a kind of elementary and unconscious reasoning. Adler has been closely followed by P. Bjerre and Freschl.

Stekel.

W. Stekel, originally a follower of Adler, takes a less dogmatic view, and explains the neuroses on both the power and the sex hypothesis, showing therein a partial reversion to Freud. He applies the systems of Adler and Freud somewhat superficially more to the consideration of every-day human motives than to the deep elucidation of confirmed mental derangements.

Pfister.

O. Pfister, a clergyman and educationist, was the first lay psycho-analyst. He introduces in his writings an ethical note quite foreign to Freud, and leans to a metaphysical view of the biological value—as compared with the personal value—of the propagation instinct. He also uses some of the teachings of psycho-analysis to reinforce the position of Christian morality, and attempts to point out the way for the general utilising of the energies bound up in primitive instinct.

Jung.

C. G. Jung, a disciple of Freud, developed the "association method." This, which originated with W. Wundt, consists of noting the answers given by the patient to each in a series of stimulus words; any unusual reaction, delay of reaction, or total failure indicates that the stimulus word is associated in the patient's mind with buried complexes tinged with an unpleasant emotional tone. The term "complex" is used by Jung to denote all groups of ideas, part, or all, of which are inaccessible to consciousness. Beyond this Jung parts company from Freud, and names his form of psycho-analysis "analytical psychology."

He saw how Freud's views could explain certain types of cases, and how Adler's theory was equally applicable to a number of neurotic manifestations; and so he described two types of human character. Firstly, we have the "extroverts," who are in the majority, who adapt themselves on a basis of emotional reaction and are swayed—at least unconsciously—by the sex-instinct. Secondly, there are the "introverts," few and far between, who are the reasoned type whose search for power proves the guiding factor in their lives. Thus the reactions of the extrovert will support Freud's psychology and those of the introvert Adler's. Jung does not, however, deny the possibility of traits appertaining to one type being to some extent present in the other.

Libido Theory.—We now come to Jung's "libido theory." By libido he means, not libidinous trends, but a primitive psychic force, an elementary mental urge, comparable to H. Bergson's "élan vital," a fundamental force which expresses itself through both sex and ego paths; but only that libido which is thus actually finding expression can be called sex-instinct or power-instinct. As a result, those early infantile trends which Freud considers as sexual because they develop into a full-grown sex-instinct Jung prefers to describe as undifferentiated libido; similarly, the origin in sex of manifestations no longer sexual he does not regard as sufficient justification for calling these manifestations a direct expression of the sexual urge.

He now reaches the point where he is farthest away from Freud—that is, in his conception of the ætiology of neuroses. Neurosis, according to him, is not due to old infantile trends still struggling for expression, as described by Freud, but is caused by a present difficulty, a present conflict, and a present failure of adaptation. The present failure causes a blocking of the flow of libido—of what some would now call the flow of interest—and the libido, no longer being able to apply itself to real and external objects, begins to "regress" to old infantile paths and express itself there as phantasy. Thus the fixations which to Freud are the cause of the *occurrence* of the neurosis are considered here merely as determinants for the *form* the regression will take.

This present difficulty and failure of adaptation causing the neurosis will make its effect felt in those manifestations of the unconscious that are dreams, so that over and above the symbolic representation of the regression (which constitutes the Freudian interpretation) will be found reactions referable to the present difficulty that has caused this regression. Thus the dream presents also a subliminal picture of the dreamer's waking state, and in so far as these unconscious reactions may directly affect conscious thought the dream may be prophetic. Jung says that this dream work resulting directly from the present conflict is in the nature of an attempt at solving the present-day problem, but as all problems can be solved only by analogy, then use must be made of the material afforded by past problems—that is, by the fixations of Freud. Therefore, according to Jung, the dream is not so much the fulfilment of an old wish as the attempted solution of an actual difficulty by analogy with an old one. He looks at the present where Freud looks back and Adler looks ahead. Moreover, he believes that infantile fixations are present, in varying degrees, in everybody, and it is only on the use which the individual may make of them that abnormality depends. As against Freud, too, he denies that parent fixations are primarily fixations to the real parents, for they are fixations to an idealised conception for which they stand—the parent imago—which symbolises general and primitive conceptions, such as those of love, anger, fear, authority, &c.

Personal and Impersonal Unconscious.—Jung further found that, in protracted analyses, any particular symbol might recur with disconcerting persistency, but would gradually become divested of all associative relation with any of the patient's personal experiences, and would approximate more and more to those primitive and universal symbols such as are found in myths and legends. This led him to suspect that the unconscious is not only composed, as Freud would have it, of material which has been repressed from consciousness, but also contains elements which are not referable to personal experience, have never been conscious, and are archaic and universal—these being explainable on the assumption of a racial memory, comparable to the personal memory accounting for the personal contents of the unconscious. Jung then develops his views of the unconscious much as follows: Everyone is endowed with a primitive unconscious which is "universal," "impersonal," "collective," and "archaic," and which contains, potentially at least, all the possible attributes of the human mind, the evil and the good, the low and the lofty, the demoniacal and the divine. As personal development proceeds certain elements from this impersonal unconscious become conscious; as consciousness further enlarges more and more is brought up from the primitive unconscious. These elements that thus become conscious—really excerpts from the collective psyche—become personal in so far as they are the guiding factors for personal adaptation; the primitive unconscious, of course, always remains impersonal. If, however, any of the conscious and personal contents be subsequently repressed they will become unconscious once more, but because they have been once related to personal experience they will constitute a new unconscious, the "personal" unconscious—the only one recognised by Freud. These "personal" contents, both conscious and unconscious, can yet hardly be called "individual," for they are ultimately but a selection from the elements found in the primitive or "collective" unconscious; if these contents which owe their "personality" to their having at some time become conscious are not in themselves "individual," it is because they are potentially present in everybody. What *is* "individual," however, is the *selective process* by means of which these rather than any other contents have been withdrawn from the impersonal unconscious and made personal. Now as the analysis of a patient proceeds he assimilates to consciousness all those unconsciousness elements which had once been conscious before, but had subsequently been repressed; as time goes on, however, the patient begins to assimilate some of the contents of the impersonal unconscious—that is, collective material that would normally never have become conscious at all. This, therefore, enlarges his consciousness—i.e., his personality—and by thus possessing consciously more and more of what is universal he tends to lose his individuality and identify himself with the collective. The material thus assimilated from the collective psyche appears first as phantasies; and in order to guard against such an assimilation destroying individuality, Jung urges that these phantasies should not only be reduced into a symbolic representation of the archaic trends remaining in the collective unconscious, but should be given a real psychological value by finding in them an actual and present attempt at influencing consciousness by the unconscious—that is, by interpreting these phantasies hermeneutically in terms of an actual reaching towards something, a pursuing of a life-line at the moment, as well as by interpreting them in terms of old and racial trends; thus will we be able to adjust the unconscious to the conscious, the collective to the individual, the nonrational to the rational, without either principle doing violence to the other. Finally, Jung ascribes to this possible unifying of collective and individual, without losing either, a definite ethical value which he traces to the attempts of the collective phantasy at guiding personal consciousness.

The main exponents of Jung's view are J. Allcock, E. Bleuler, M. K. Bradby, C. Long, A. E. Maeder, M. Nicoll, and F. Ricklin.

Silberer.

H. Silberer is a follower of Jung, but leaves the realm of medicine for that of mysticism. He admits

Freud's reductive interpretation of symbols revealing infantile trends, and also Jung's subliminal and hermeneutic interpretations. On studying the symbolism of the hermetic arts, he found that the higher philosophical teachings of alchemy are clothed in chemical symbols, so that within every chemical interpretation of the alchemists there is a deeper philosophical one, alchemy standing in the same relationship to chemistry as Freemasonry does to masonry. He then draws a parallel between the reductive interpretation of dreams and parables according to Freud, the subliminal interpretation of Jung, and the symbolism of alchemy, thereby adding his alchemic or natural philosophic interpretation of the unconscious to those of Freud and Jung. He further finds that a persistent symbolism, say in dreams, gradually changes its value, or at least loses some as analysis proceeds, and comes to stand out as something archaic. In this he reaches the same conclusion as Jung, but he elaborates the view further and shows that whereas that symbolism was first personal and *material*—that is, referred to actual memories or wishes—it became finally impersonal and even *functional*—that is to say, it became indicative not of mental *contents* but mental *modes*, methods of working of the human psyche. These functional symbolisms show strivings of a theosophical nature, and their interpretation he calls "anagogic." He points out that the reason why all symbols can be interpreted reductively as well as anagogically is because to each philosophical aspiration there corresponds, as a substitute in the time of stress (or neurosis) the easier path of regression to the primitive and elementary. "Dæmon est deus inversus," and he here introduces a concept of good and evil of no little importance to metaphysics.

(To be concluded.)

ADMINISTRATION OF PUBLIC MENTAL HOSPITALS:

RECOMMENDATIONS OF THE MINISTRY OF HEALTH (LOMAX) COMMITTEE.

WE deal in a leading article this week with the broad lessons of the report of the Committee on Administration of Public Mental Hospitals. The personnel of this committee consisted of Sir Cyril Cobb (chairman), Dr. R. Percy Smith and Dr. Bedford Pierce, with Mr. P. Barter as secretary. It may help our readers to follow the discussion on this report if we set out here at length their recommendations. It should be borne in mind that the Committee was limited in its inquiry by its terms of reference which were as follows:—

To investigate and report on the charges made by Dr. Lomax in his book ("The Experiences of an Asylum Doctor") and to make recommendations as to any medical or administrative improvements which may be necessary and practicable in respect of the matters referred to by Dr. Lomax without amendment of the existing Lunacy Laws.

The last seven words of these terms should not be forgotten when reading the Committee's recommendations.

Recommendations.

1. That for the future the size of mental hospitals should so far as possible be limited to accommodation for 1000 patients of all classes, and that the advantages of a central institution of relatively small wards supplemented by a series of detached pavilions should be carefully borne in mind; in particular, the reception wards and convalescent wards should be in separate buildings from the main wards of the institution. At Prestwich Asylum a suitable admission ward on the male side and an operating theatre should be provided, and a proper sewerage system installed.

2. That in classification some account should be taken of the home conditions and surroundings from which the patient comes.

3. That the superintendent should be a medical practitioner, and that in future appointments preference should be given to those who have obtained a diploma in psychological medicine, and who have served the office of house surgeon or house physician in a general hospital. That a small advisory board, preferably associated with the Board of Control, should be available for consultation by visiting committees when making these appointments.

4. That the number of assistant medical officers should be increased, and full facilities given for study leave (this is urgently needed at Prestwich); that a proportion of the medical staff in mental hospitals should be recruited from those who have had some previous general experience as house surgeon or house physician; that the appointment of consultants and of a visiting dental surgeon to all large mental hospitals is desirable.

5. That the Departmental Committee on the Nursing Service should be asked to consider the following suggestions: (*a*) Some distinction should be made between the two duties of mental nurses—namely, nursing proper and social duties; that the hours devoted to the former should be relatively few, but that more time should be given to the latter; and that the present rigid system involving short shifts of duty should be discontinued; (*b*) the mental nursing service requires coördination with the general body of nursing, and steps should be taken to attract a better class of probationer, particularly in the case of female nurses; (*c*) every institution should have at least one fully qualified hospital nurse on its staff. That at Prestwich the lectures for nurses should be re-started immediately, if this has not already been done.

6. That seclusion requires a more precise definition by the Board of Control; and that the practice in regard to seclusion for short periods at Prestwich should receive the attention of the authorities.

7. That the diet of mental hospitals generally and at Prestwich in particular requires improvement in the direction of greater variety; and that patients who are allowed to stay up after 8 o'clock should be given some light refreshment during the evening.

8. That the employment of patients in workshops and the occupation of patients who might otherwise do nothing, would be improved, especially in regard to the variety of work, by the appointment of a special officer at each institution to act as occupations officer; that the possibility of the payment of commensurate remuneration to patients doing useful work should be considered. That at Prestwich the organisation of employment, occupation and outdoor exercise of patients requires further development.

9. That visiting committees should consider the desirability of providing letter boxes in which patients can post their letters; and that in every ward a notice should be posted up informing patients of their right to forward letters unopened to the authorities prescribed by Section 41 of the Lunacy Act, 1890.

10. That the organisation of after-care work needs to be considerably strengthened and extended, particularly in the provinces, with a view to facilitating the discharge of patients who, though not fully recovered, could dispense with institutional care if suitable sheltered conditions were provided outside. That notices should be placed in the waiting rooms of public mental hospitals to inform friends and relations of patients of the provisions of Section 79 of the Lunacy Act, 1890, empowering them to make application for the discharge of a patient.

11. That the provision of facilities for the early treatment of incipient mental disorder without certification, though not within our terms of reference, would in our opinion be of great value to the community.

12. That the possibilities of coördinating the higher research work by concentrating it in a few fully equipped institutions, which could be used as training centres, should receive careful consideration.

13. That the visiting committees should be strengthened by the coöption of persons who have special qualifications and time to devote to the work; failing special legislation, this could be effected to a large extent if the authorities availed themselves of the powers provided in Sections 28 and 66 of the Mental Deficiency Act, 1913; that apart from official visiting committees, local authorities should consider the desirability of authorising a small unofficial committee of responsible persons to visit their mental hospitals from time to time and report thereon; that greater facilities should be allowed for friends and relatives to see patients in the wards of mental hospitals.

14. That additional assistance is necessary to enable the commissioners of the Board of Control to carry out the heavy duties now devolving upon them.

15. That the attention of the authorities should be drawn to the following: (*a*) The character of the arrangements for the daily toilet in mental hospitals; (*b*) the number of hours during which patients are kept in bed; (*c*) the importance of tact and consideration on the part of officers and other members of the staff of mental hospitals in dealing with the friends and relatives of patients; (*d*) the possibility of facilitating the transfer of certain chronic patients.

HOSPITALS OF LONDON COMBINED APPEAL: INTERIM DISTRIBUTION.

As was announced in THE LANCET last week, the President and Council of King Edward's Hospital Fund for London, at a special meeting held on August 1st, decided to distribute £150,000 among the coöperating hospitals. This sum has now been paid over and each hospital has been informed in a covering letter that the cheque is on account of the grant to be awarded to the hospital out of the proceeds of the Combined Appeal; that it includes all sums notified to the King's Fund as earmarked to the hospital down to July 28th; that a further payment on account will be made after the holidays; but that neither the first payment on account, nor the first and second taken together, will necessarily represent the judgment of the King's Fund as to the proportions in which the ultimate total proceeds of the Appeal should be allocated.

The following are the awards:—

	£
Acton Hospital	235
All Saints' Hospital	405
Antivivisection Hosp.	330
Baby Clinic and Hosp. (Kensington)	150
Beckenham Cottage Hospital	160
Belgrave Hospital for Children	525
Blackheath and Charlton Hospital	160
Bolingbroke Hospital	415
Brentford Cottage Hosp.	30
British Hospital for Mothers and Babies, Woolwich	285
Cancer Hospital	765
Canning Town Women's Settlement Hosp.	255
Cent. Lond. Ophthalmic Hospital	400
Central Lond. Throat and Ear Hospital	400
Chelsea Hospital for Women	500
Cheyne Hospital for Children	400
City of London Hosp. for Dis. of the Chest (Victoria Park)	1745
City of Lond. Maternity Hospital	590
Clapham Matern. Hosp.	300
Dreadnought Hospital (Seamen's)	3310
East End Mothers' Lying-in Home	370
East Ham Hospital	110
East London Hospital for Children	2200
Elizabeth Garrett Anderson Hospital	1150
Eltham and Mottingham Cottage Hospital	95
Evelina Hospital	680
Finchley Cottage Hosp.	190
Florence Nightingale Hospital for Gentlewomen	350
General Lying-in Hosp.	350
German Hospital	1040
Grosvenor Hospital for Women	285
Guy's Hospital	8950
Hampstead General and N.-West Lond. Hosp.	1800
Hendon Cottage Hosp.	265
Hornsey Cottage Hosp.	235
Hospital for Consumption, Brompton (including Sanatorium at Frimley)	3460
Hospital for Epilepsy and Paralysis	690
Hosp. for Sick Children	3600
Hosp. for Women (Soho Square)	540
Hosp. of St. John and St. Elizabeth	890
Hostel of God	145
Hostel of St. Luke	80
Infants' Hospital	350
Italian Hospital	220
Jewish Maternity Home	85
Kensington, Fulham, and Chelsea General Hospital	255
Kensington Disp. and Children's Hosp.	80
King Edward Memorial Hospital (Ealing)	365
King's College Hospital	5500
London Fever Hospital	955
London Homœopathic Hospital	1355
London Hospital	10400
London Jewish Hospital	315
London Lock Hospital	1380
London Temperance Hospital	1500
Maternity Charity and Dist. Nurses' Home, Plaistow	1565
Metropolitan Ear, Nose and Throat Hospital	145
Metropolitan Hospital	2250
Middlesex Hospital	5615
Middlesex Hosp. Cancer Charity	855
Mildmay Memorial Hospital	185
Mildmay Mission Hosp.	640
Miller General Hosp. for South-East London	2200
Mothers' Hosp. of the Salvation Army	540
National Hosp. for Dis. of the Heart	460
National Hosp. for the Paralysed and Epileptic	2500
Nelson Hosp. (South Wimbledon)	235
Northcourt Hosp. and Home for Sick Children (Hampstead)	380
North Islington Infant Welfare Wards	75
Paddington Green Children's Hospital	445
Passmore Edwards Hosp. for Wood Green, &c.	170
Poplar Hosp. for Accidents	1055
Prince of Wales's Gen. Hospital	2300
Queen Charlotte's Lying-in Hospital	885
Queen Mary's Hosp. for the East End	1860
Queen's Hospital for Children	2700
Royal Dental Hospital of Lond.	345
Royal Eye Hospital	560
Royal Free Hospital	5000
Royal Hosp., Richmond	395
Royal Lond. Ophthalmic Hospital	1740
Royal National Orthopædic Hospital	2445
Royal Northern Hosp. (with which is amalgamated the Royal Chest Hospital, City road)	5500
Royal Waterloo Hosp. for Children & Women	1050
Royal Westminster Ophthalmic Hospital	410
St. Andrew's Hospital (Dollis Hill)	210
St. Bartholomew's Hosp.	7700
St. Columba's Hospital	300
St. George's Hospital	3500
St. John's Hospital, Lewisham	1165
St. John's Hosp. for Diseases of the Skin	365
St. Luke's Hosp. for Advanced Cases	225
St. Mark's Hospital	325
St. Mary's Hospital	3350
St. Mary's Hosp. for Women and Children, Plaistow	720
St. Monica's Home Hosp.	200
St. Peter's Hosp. for Stone	385
St. Saviour's Hosp. for Ladies of Limited Means (Osnaburgh-street)	125
St. Thomas's Hospital	7700
Samaritan Free Hosp. for Women	650
Santa Claus Home	145
S.-Eastern Hosp. for Children (Sydenham)	585
South London Hosp. for Women	1005
Stoke Newington Home Hosp. for Women	120
Streatham Babies' Hospital	105
Univ. College Hospital	4000
Victoria Hospital for Children	1285
Walthamstow, Wanstead, and Leyton Children's and General Hosp.	355
Weir Hosp. (Balham)	195
West End Hosp. for Nervous Diseases	670
Western Ophthalmic Hospital	300
West London Hospital	3150
Westminster Hospital	3000
Willesden Hospital	630
Wimbledon Hospital	255
Winifred House Invalid Children's Convalescent Hosp. Home	120
Woolwich & Plumstead Cottage Hospital	60
Woolwich and District War Memorial Hospital	1000

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Work and a Knowledge of Irish.

THERE are some parts of Ireland where, without doubt, a knowledge of Irish is almost a necessity for a medical man working among the people. One notices, however, as one of the results of the present desire to revive the native tongue throughout the whole land, a disposition to demand a knowledge of Irish from candidates for public medical appointments, not only in Irish-speaking districts, but in districts in which there is not a single native speaker. For example, in the co. Meath, where English has been the vernacular for generations, the county hospital committee refused to consider the candidature for the post of surgeon to the county hospital of any medical man who did not pass an examination test in Irish. The advice of one member of the committee to "waive the condition and select the best doctor" was rejected, and several candidates were ruled out. If such a condition is made compulsory in many districts, it will necessarily have the effect of diminishing medical competition for the public services, and in some cases, at any rate, appointments will not go to candidates who are professionally the best.

Monaghan and Cavan Asylum.

The annual report of the medical superintendent of the Monaghan and Cavan Asylum, presented to his committee recently, states that the average number of patients resident during the year 1921 was 795, or 26 less than in the previous year. The deaths were 61 in number, and were all due to natural causes. There were 4 cases of influenza, 2 of erysipelas, and 5 of typhoid, the source of which could not be traced. The gross and net costs per head were £50 3*s*. 4*d*. or £42 18*s*. 10*d*. respectively. The medical superintendent deprecates the housing in asylums of harmless senile cases and of imbecile children.

Tuberculosis in Co. Louth.

The annual report of Dr. C. McDonnell, tuberculosis officer for co. Louth, recently published, states that during the year he examined 214 patients, in 186 of whom tuberculosis was present. Of the tuberculous patients, 153 suffered from pulmonary disease. As regards results 22 died, 18 gave up treatment, and 52 were discharged as fit to resume work. Dr. McDonnell regrets that there is no system of domiciliary treatment working in the county, and that there is no provision for dealing with advanced cases. He urges also the institution of medical inspection of school children, a measure already ordered by statute. There is only one whole-time nurse in the service of the tuberculosis committee.

Public Health Services.

DEFAULT IN NOTIFICATION OF BIRTHS AND OF TUBERCULOSIS.

IN his presidential address to Section I. of the Royal Sanitary Institute Sir Arthur Newsholme emphasised the need for much more general and complete fulfilment of the duty of prompt medical notification of cases of tuberculosis, and expressed the view that with increasing sense of communal duty the *via dolorosa* to the ideal of a hygienic conscience—constituted by appearance in a police court in default of notification—ought seldom to be necessary. In a recent circular issued to medical practitioners in Surrey Dr. H. J. Cates, county medical officer of health, draws attention to the same subject, remarking that not infrequently, the death certificate is the first intimation a medical officer of health receives of cases of tuberculosis. This is a subject of great public importance, and we hope that complaints of non-notification or much belated notification will, ere long, become much less justified by facts. The extent to which the legal obligation of notification is acted upon has importance beyond the actual figures of notification; for it is an index of the extent to which medical practitioners and medical officers of health are coöperating in securing the best treatment for every patient and in promoting the hygienic welfare of every afflicted family. In the circular mentioned above, Dr. Cates states that in Surrey during the year 1921 there was a failure to notify births in more than 10 per cent. of the total number of births registered. It is not mentioned to what extent the failure to notify was on the part of doctors, midwives, or parents, and this figure probably could not be given, as the Notification of Births Act imposes a dual responsibility on the parent and on the person in attendance on the mother. There can be no doubt as to the importance of the doctor impressing on the parent of the child the necessity of immediate notification of its birth when he himself is not willing to notify. Unless the doctor has cause to believe that notification is being made by the parent, the legal obligation to notify devolves upon him. This duty has never been acceptable to the medical profession, and we hope that it may, come soon within the range of practical politics to consider whether notification and registration of births might not be unified, registration being expedited to an extent which would justify abolition of the present dual machinery.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Norwich.

THE annual report for 1921 states that the population of the city is 122,400, the birth-rate 22·1 per 1000, and the death-rate 11·3 per 1000. The death-rate of infants under 1 year is 75 per 1000, deaths of legitimate infants 72·5, and of illegitimate 129·5 per 1000. Dr. H. Cooper Pattin remarks that the only general features affecting the health of the community calling for special comment were (*a*) the prolonged prevalence of unemployment and the consequent relative underfeeding of sections of the population; and (*b*) the taking over by the community of the public water-supply, the direct control of which is now vested in a committee of the city council. As to maternity and child welfare work, 298 confinements were attended—20 in the ward, 278 outside, and 220 of the mothers attended the ante-natal clinics. There were 193 sessions of the infant welfare clinics, 1250 new babies were brought, and the total number of attendances was 11,614. Dr. Pattin considers that the final effects of restrictions relating to milk issued by the Ministry of Health may prove to be anything but economical in the long run, since the money value of the time taken up in the investigation of claims, in the signing, registering, and revising of the orders, and auditing of the accounts is considerable.

Medical inspection in the schools of some 8000 children revealed defects sufficiently serious to need medical treatment in 11 per cent. of the total number examined; 379 of these were enlarged tonsils and adenoids, 420 defects of vision, and the school dentist found defective teeth in 75 per cent. of children examined.

The total deaths during the year from tuberculosis were: pulmonary tuberculosis, 147; other forms, 26. Since May 1st, 1921, the city council has undertaken the responsibility for the treatment of tuberculosis in both insured and uninsured persons, and more systematic efforts have been made to get early knowledge of the disease, by clinics held after working hours. 160 notifications of all forms of tuberculosis were received, and information obtained from 134 of these cases revealed evidence of family taint in 35·8 per cent. Officers of the department paid 1592 visits to the homes of the patients reported, and found that at the time of the first visit 36 per cent. occupied a separate bedroom, 12 per cent. a separate bed in a double-bedded room, and 52 per cent. shared a bed with another, presumably non-consumptive person. There is a considerable amount of overcrowding in the city and numbers of unsatisfactory habitations, only 149 new houses having been erected during the year.

Edinburgh.

Dr. A. Maxwell Williamson tells us in his report that the statistics for 1921 apply for the first time to the city as recently extended by the inclusion of Leith, and a considerable suburban area, and that statistics for recent years have been corrected in accordance with the information afforded by the Census. A comparison of the Census of 1921 with that of 1911 shows that the population of Edinburgh declined slightly, while that of Leith and the added suburban area increased during the intercensal period. The net decrease of the three combined districts was 3782, and the total population of the extended city 420,264. The area of the city is now 32,526 acres. For 1921 the birth-rate was 21·5, the death-rate 14·4, the infant mortality rate 96, the cancer death-rate 1·5, and the phthisis death-rate 0·9. The policy of the Public Health Committee has been to build on the outskirts and to clear slums and reconstruct in the centre. Dr. Williamson considers that success in public health efforts in the past has been largely due to improved housing, and that if the present stoppage in housing schemes continues the result is bound to be disastrous. For the moment he advocates the clearing away of old unoccupied obstructive buildings; that owners be required to make their property fit for human occupation, and that the corporation, unaided by Government, provide on a fairly liberal scale new and reconstructed houses in the central districts of the city, where the need is now most acutely felt. The hospital arrangements have been reorganised. The Victoria Hospital is still used for early cases of pulmonary tuberculosis, the old Leith Fever Hospital being set apart for advanced cases. All ordinary infectious cases are taken at Colinton Mains Hospital, the shelters at Colinton Mains being utilised to provide accommodation for 63 cases of non-pulmonary tuberculosis. Polton Farm Colony provides accommodation for 21 convalescent tuberculous cases, while the Craiglockhart Poor-house pavilions take in 48 parish cases of pulmonary tuberculosis. Dr. Williamson thinks that for disciplinary reasons the last-named cases would be better under the parish authorities. He records a rather unusual scarlet-fever milk epidemic; no less than four milk-supplies were involved and 337 cases occurred. The need for a measure of compulsion to secure continuity of treatment for venereal diseases is insisted on. The increase in the cancer mortality continues; the deaths from cancer very nearly approximated the total number of deaths from pulmonary tuberculosis, measles, whooping-cough, and all other forms of infectious disease. Dr. Williamson points out that milk adulteration in Edinburgh pays, owing to the inadequate penalties inflicted when a conviction is

obtained. There were 61 cases of ophthalmia neonatorum notified during the year; in one case the right eye was damaged and three children lost the sight of one eye.

SCHOOL MEDICAL SERVICE.

Derbyshire.

THE number of inspections made during the year was 28,518, including 25,939 in elementary and 2579 in secondary schools, and there was an attendance of 5984 parents during the year. Exclusions from school numbered 810, 160 on account of verminous conditions and 650 for medical reasons. Of these, 259 were excluded on account of tuberculosis. Dr. S. Barwise puts in a well-justified plea for the continuance of the excellent standard which has made the reputation of Derbyshire educational work famous for the last few years. As he says, "What is the use of attempting to teach a child who cannot hear the teacher, or one who cannot see the blackboard?" He has been unable to complete the tables required by the Board of Education, as to do this would require a card index for each child and a prohibitive cost, and a vast expenditure of labour which, with a depleted staff, is impossible. The teachers were able in reply to a questionnaire to state that of tonsil and adenoid operations children were improved in health in 79 per cent. and in school work in 75 per cent. Dr. Mary Gallagher operated on 1403 cases during the year, and has analysed the records of 300. In only 7 was there no improvement, but in 209 cases of defective hearing without ear discharge, hearing was improved in 104 and became normal in 99. The minor ailment clinic treated three-quarters of the cases notified (4353), but owing to the reduced medical staff it has apparently not been possible to keep up a weekly attendance of a doctor at each of these clinics. This appears to be a penny-wise policy on the part of the county council. The proportion of deformities found amongst the secondary school-children was considerably higher than in the elementary schools, and Dr. Barwise suggests that the appointment of two supervisors for physical training will remedy this.

Wigan.

This is Dr. Henry Whitehead's first report. 7175 children were inspected. "The school clinic in Rodney-street is open five mornings a week, and is almost always overcrowded," but "no review of the hygienic conditions of the schools in the area has been made during the past year owing to pressure of work in the department." Wigan is lucky as far as diphtheria is concerned, there being only 25 cases this year and 6 the year before. "It is somewhat deplorable to find in these days a great number of children with verminous heads. This state of affairs is difficult to understand, seeing that such a large amount of money is spent on education." Dr. Whitehead underlines precisely what has been pointed out for the past dozen years—namely, that the mere mechanism of cleansing the filthy does little to establish a health conscience, and until the school becomes a social centre there will be more or less a standstill in personal hygiene. More adequate arrangements for the treatment of enlarged tonsils and adenoids appear advisable. Out of 850, 300 received treatment.

Stirling.

In Stirling 11,778 routine inspections were made, and "no fewer than 10·78 per cent. of the parents attended, this being the largest percentage of parents attending since the institution of school medical inspection." Popular interest in children's health requires stimulating in Scotland. The number of children with verminous heads was double that of the previous year. Dr. T. Adam finds it difficult to account for this. It might, perhaps, be due to a more intensive method of examination. Ringworm of the head occurred only in 16 cases; scabies in 14 cases compared with 32 last year. Thirty-nine cases of stammering (35 boys and 4 girls) and 80 other cases of defective speech were found, but there appears to be no treatment available for this defect. Twenty-five per cent. had good teeth, and the new scheme for dental treatment is working smoothly and satisfactorily. Congenital cardiac cases discovered numbered 7, while 35 had acquired organic disease. The school nurses besides assisting at the various clinics do the "following up" here, and Dr. Adam says that without their aid much of the benefit of the inspections would be lost. Altogether they visited 4675 children's homes after medical inspection. A considerable increase in the heights of 5-year old boys, with no corresponding increase in weight, was noted. The height of 5-year old girls showed an increase, with an accompanying increase in weight; 140 more girls than boys were examined in this age-group.

The Services.

ARMY MEDICAL SERVICE.

Maj.-Gen. C. E. Pollock, late R.A.M.C., to be Deputy Director-General, vice Maj.-Gen. Sir George B. Stanistreet, late R.A.M.C. (vacated).

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lt.-Cols. to be temp. Cols. whilst spec. emplyd.: G. M. Goldsmith and C. J. O'Gorman.

Temp. Lt.-Col. F. L. Vaux relinquishes his commn. and retains the rank of Lt.-Col.

The undermentioned Majs. retire on retired pay: R. J. C. Thompson (on account of ill-health contracted on active service) and A. H. Hayes.

The undermentioned Capts. retire, receiving a gratuity: R. J. Clausen and H. Mitchell.

ARMY RESERVE OF OFFICERS.

Capt. H. E. A. Boldero resigns his commn.

TERRITORIAL ARMY.

Maj. G. F. Haycraft resigns his commn. and retains the rank of Maj.

Sanitary Company: Capt. J. Grounds to be Maj.

The undermentioned vacate the appt. of D.A.D.M.S. to the Divns. shown against their names: Lt.-Cols. C. I. Ellis (Wessex Divn.) and P. Paget (Lancs. Divn.); Majs. L. A. Avery (E. Angl. Divn.), F. W. Squair (Highl. Divn.), (Bt. Lt.-Col.) H. A. Leebody (Lowl. Divn.), C. J. Martin (Northern Divn.), G. B. Robinson (Home Counties Divn.), E. J. T. Cory (1st Lond. Divn.), and C. H. Lindsay (W. Lancs. Divn.); Capts. O. Teichman (2nd Lond. Divn.) and J. Grant-Johnston (S. Mid. Divn.).

Majs. O. L. Appleton and E. J. T. Corey, having attained the age limit, are retired and are granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

The undermentioned officers relinquish their commns. and retain their rank except where otherwise stated: Capts. J. Bannerman, W. M. Langdon, C. E. Whitehead, B. E. A. Batt, R. H. Swindells, J. W. Scott (granted the rank of Maj.), and (Bt. Maj.) W. Brander (granted the rank of Maj.).

Capt. P. Hickey, from Durham L.I., T.A. Res., to be Lt. and relinquishes the rank of Capt.

J. Broadfoot (late R.A.M.C., T.F.), to be Lt.

General Hosp.: Lt.-Col. F. E. A. Webb resigns his commn. and retains the rank of Lt.-Col. with permission to wear the prescribed uniform.

Supernumerary for Service with the O.T.C.: Maj. Sir W. Taylor resigns his commn. and is granted the rank of Col.

Capt. F. C. Purser resigns his commn. and is granted the rank of Maj.

Capt. W. Gilliatt resigns his commn. and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Majs. J. D. Fiddes and W. S. Richardson, from Genl. List, to be Majs.

Maj. G. Mackie, from Genl. List, to be Lt.-Col.

ROYAL AIR FORCE.

B. C. W. Pasco is granted a short service commn. as a Flying Officer (Hon. Flight Lt.).

H. A. Tillman (temp. Capt., R.A.M.C.) is granted a temp. commn. as a Flight Lt.

THE Chelsea Hospital for Women has received a grant of £75 from the Court of Common Council of the City of London.

Correspondence.

"Audi alteram partem."

UNEMPLOYMENT AND HEALTH.

To the Editor of THE LANCET.

SIR,—The deputation from the People's League of Health which, as you announced last week, waited on Sir Montague Barlow on August 2nd, laid stress on the prejudicial effect which unemployment exerts not only on the physical health, but also on the mentality and the morale of the unemployed.

It was pointed out by several members of the deputation (and on this point psychologists are in general agreement) that absence of regular occupation, together with the constant anxiety as to the future which enforced idleness brings, not only diminishes will power, it also depreciates judgment and mental equilibrium and renders the unemployed person a more easy prey to the agitator and his revolutionary teaching. Bearing in mind also the rapid effect which insufficient food and depressing surroundings exercise, and the long time it takes to restore the damage so caused, it becomes urgently necessary to prevent as far as possible physical, mental, and moral deterioration in the unemployed section of the population in order that they may be in a position to respond to the call for renewed effort when the period of trade depression has passed.

This means that the actual provision of healthy *occupation*, apart from the economic value of the work done, becomes a very important aspect of the unemployment problem, and one which has not been sufficiently appreciated by administrators and local authorities. It is also true to say that, apart from a smaller irresponsible youthful section at one end of the scale, and an older, worn-out section at the other, the bulk of the able-bodied unemployed themselves prefer payment for work rather than payment for idleness.

It is for this reason that some of the more progressive and enlightened authorities have endeavoured to base their action in dealing with unemployment on the lines of providing schemes of relief work rather than by the mere payment of money to unemployed persons whose destitution is the outcome of their unemployment. The action of the Leicester City Council (in coöperation with the guardians and other bodies) in providing, through its Distress Committee, work on a considerable scale for persons whose circumstances would necessitate their relief from public funds in any case, has proved beneficial not only to the unemployed, but to the city also. The fact that such action on the part of the municipality has not tended to increase unemployment by prejudicing private industry is shown by a comparison between Leicester and some other Midland towns.

At the end of June, 1922, the number of registered unemployed persons per 1000 of the population was—

Leicester ..	21·1	Coventry ..	58·6
Derby ..	93·0	Birmingham	85·8
Nottingham	32·9		

To this we must add the large sums amounting to hundreds of thousands of pounds paid in money to unoccupied persons with no return. On the other hand, the policy of providing relief works, as at Leicester, although more expensive in immediate outlay, has benefited the unemployed physically and psychologically, and has brought a considerable return to the community in the shape of widened and extended roads, improved public parks, turfed and levelled recreation fields, new public tennis courts and golf course, and other works of public utility.

Every city, moreover, needs a periodical spring cleaning, the cleansing and whitewashing of cattle and general markets, the cleaning and painting of public buildings, the improvement and beautifying of public parks, the cleaning and painting of miles of fencing are all works which tend to the improvement of city life.

Several factors have operated to prevent municipal authorities from taking up the provision of relief works on a large scale throughout the country. One is the notion, still prevalent in the minds of many comfortable and well-disposed ratepayers, that the unemployed class consists of idle persons whose unfortunate position is due rather to disinclination for work than to inability to find work. Another is that the initiation and organisation of sound schemes of relief work entail a considerable expenditure of time, trouble, and thought on the part of city councillors and members of distress committees, and Leicester has been especially fortunate in securing the wholehearted help of public-spirited and able administrators and public officials in this important sphere of public work.

The fact that it is impossible, of course, to provide the unemployed on a large scale with work of a kind to which they have been accustomed, and that, as stated by the Minister of Labour, schemes of relief work can only furnish direct employment for those capable of heavy physical work, does to some extent, no doubt, reduce the value of such schemes from the point of view of very extensive and general application. On the other hand, much depends on the way in which the problem is handled.

The experience of the war showed that a few weeks of graduated exercise in the open air under healthy conditions of life could bring about marked improvement in the health and physical condition of young soldiers. In the same way, provided that careful selection, grading, and supervision be exercised in the management of the unemployed when at work, the exposure and the heavy character of much of the available work need not be a too serious obstacle. Clerks, typists, and sedentary workers can be gradually accustomed to manual work in the open air, provided that the change of life is not too abrupt, and that the weaker and less fit individuals are selected for the lighter jobs. It is largely a question of the dilution of unskilled and amateur labour with a sufficient proportion of skilled and experienced workers to direct and encourage the inexperienced men.

The question of the form in which payment for the work done is made is also an important one. The contractual and contributory nature of our unemployment insurance system so far apparently requires that payment for work done must take the form of a money payment. On the other hand, guardians in relieving distress have adopted the principle at Leicester of part payment in kind; for every £1, 10*s.* is paid in money, 7*s.* in grocery, and 3*s.* in meat tickets. This system has apparently worked well at Leicester, where it has been found possible to prevent any serious abuse.

From the point of view of national health, both now and in the immediate future, it is clear that any system which tends to bring food of the right kind and quality, a balanced diet, within reach of the wives, mothers, and children, and directly into the homes of the unemployed citizens will not only tend to preserve the working capacity of the present workers, it will also tend to prevent the deterioration of our future population. Such a scheme also brings added benefit to the small shopkeepers in the city at a time of special depression.

The question arises, therefore, whether, seeing that the present condition of unemployment in the country is an emergency condition calling for special treatment, distress committees should not endeavour to bring about a revision of this problem of payment in money only and try to alter the attitude of their trade-union members in regard to it, and as opportunity arises substitute for it part payment in kind. If payment partly in money and partly in kind were the general recognised method of payment for work done under distress committees and unemployment committees, and if part payment in kind were freed from any taint of injustice or pauperism, if it were accepted by the unemployed person as a sound emergency method in a grave national crisis,

there is no doubt that from the point of view of national health and efficiency it would be preferable to the present system of payment wholly in money which is liable to the counter attractions and the leakages which attend the transit of the money from the pay office to the home and its conversion into food, clothing, and rent.

No doubt this would involve some change in the law as it stands. But salutary change, the outcome of experience, is always worth while in every field of human enterprise, and the nation cannot afford to risk a serious decline in the health and vigour of its working population. Leicester has in the past been well to the fore in progressive movements, and we are hopeful that the experience gained at Leicester may be of value in encouraging other towns to start schemes of relief work, and thus prevent such of the distress and physical mental and moral deterioration as can be prevented in this national crisis.

I am, Sir, yours faithfully,

C. J. BOND, C.M.G., F.R.C.S.,
Vice-Chairman, Consultative Committee, Ministry of Health.

Leicester, August 4th, 1922.

GRADUATED REST AND EXERCISE IN TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Through some misunderstanding the procedure at the meetings of the Third International Conference of the International Union against Tuberculosis held at Brussels from July 11th to 13th was such that it was possible for several speakers to refer to my views on auto-inoculation in pulmonary tuberculosis and to criticise my writings on this subject without giving me any opportunity, although present, to reply to their criticisms. I therefore ask your kind permission to reply to their statements through your columns.

Papers were read on three problems and during the discussion of the third subject—viz., "Work During and After Treatment"—several of the speakers in the arranged discussion stated that they "did not agree with Paterson that work had therapeutic value." These remarks only indicate want of knowledge and experience on the part of the speakers. It is not a question as to whether or not those who spoke agree with me, but whether or not they appreciate facts. Is not the rise of temperature and feeling of ill-health during active tuberculosis due to excessive auto-inoculations, and is not this excessive auto-inoculation controlled by rest for the lung? Similarly, is not the general symptom of the disease—the malaise, associated with slight fever (often undetected except on close observation)—evidence of auto-inoculation caused by excessive exercise?

To those experienced in the method of treatment advocated by me, it is well known that when these auto-inoculations are controlled by rest, the patient may generally return to the grade of exercise which caused the fever and continue on this without receiving a second auto-inoculation on that grade. This fact, with the additional evidence that not only does the patient commonly feel better after the incident but that the expectoration becomes less than before, surely proves the establishment of some degree of immunity.

I would also ask if the observations made by Wright and Inman concerning the opsonic index are accepted by the speakers at the Congress as facts, or are they also untrue; and finally, how it is possible to explain the complement-fixation test unless by auto-inoculations? The whole question is whether the various points to which I have referred are facts or not. If they are, then auto-inoculations do take place, and regulated rest and exercise in skilful hands is an important therapeutic measure. I have never failed to convince medical men who have taken the trouble to go into the matter with me, that treatment by auto-inoculation is both possible and beneficial in pulmonary tuberculosis. I think they have also realised that it is by no means an easy treatment, because of the attention to detail which is demanded on the part of the physician-in-charge. Possibly the fact that this personal attention to detail has been lacking has been the cause of the disbelief in the therapeutic value of graduated rest and exercise.

I am, Sir, yours faithfully,

MARCUS PATERSON.

Colindale Hospital, N.W., July 26th, 1922.

THE POSTPONEMENT OF THE WORKING OF THE DENTISTS ACT.

To the Editor of THE LANCET.

SIR,—There is reason to think that the postponement of the date on which the Dentists Act, 1921, will come into force from July 28th until Nov. 30th this year has given rise to some misapprehension. I am therefore directed to write and say that any practitioner who has been registered comes within the jurisdiction of the Board, and should pay very careful attention to its warning notice in regard to advertising and canvassing. The extension of the Act does not permit any relaxation in regard to this.

It is possible that there are some practitioners who have been notified that they are eligible for registration who are refraining from completing their applications in order that they may be able to continue the practice of advertising and canvassing. If any such cases were brought to the notice of the Board this matter might have a bearing on the question of good personal character.

There are some practitioners who have in their employment assistants who are intending to pass the prescribed examination as soon as they can. The Board would be unwilling that these unregistered assistants should be penalised. At the same time the warning notice in regard to "covering" must be observed, and such assistants should confine their work to mechanical duties or to matters which do not require professional discretion or skill, and should perform them only under the immediate personal supervision of their employers.

I have to add that the concession that ex-Service candidates may count work done up to July, 1922, instead of only to July, 1921, has no bearing upon the eligibility for registration of those who had not attained the age of 23 years on July 28th, 1921. The question of age is one upon which the Act is very definite and the Board has no discretion in regard to this matter.—I am, Sir, yours faithfully,

NORMAN C. KING,
Registrar.

Dental Board of the United Kingdom, 44, Hallam-street, London, W. 1, August 5th, 1922.

CLINIC EXPERIENCE IN CONTRACEPTION.

To the Editor of THE LANCET.

SIR,—In the pages of THE LANCET of July 22nd, p. 195, appears a condensed account of the meeting on contraceptive technique, held under the auspices of the Malthusian League, the principal contribution being that by Dr. Norman Haire, who mentions that he has had 200 cases, and that all have been successful. At our Birth Control Clinic, at 61, Marlborough-road, London, N. 19, which is the first British clinic purely for birth control, we have dealt with a *thousand* cases, and we have found that less than 1 per cent. of normal women are unable to be fitted with the small occlusive cap of the type we use. Of recorded failures after instruction in the cap we have about 0·5 per cent. of the total number who have been fitted. In two or three instances of recorded failure we suspect that the woman herself has been careless. Every practitioner knows that there are incorrigibly careless patients. Where the cervix is torn, proliferated, seriously injured, or abnormal in any other way this type of cap is not feasible, and recourse may then be had to the inverted or Dutch cap, apparently favoured by Dr. Haire for all cases. Against the use of

which, however, I see certain physiological objections. Where the use of the small occlusive cap is impracticable the Dutch cap is probably the next best thing.

The experience at our clinic, I think, confirms not only my own view but the view expressed some months ago by the Special Medical Research Committee of the Society of Constructive Birth Control, that the internal cap for the woman affords an adequate and satisfactory measure of contraception for normal cases. Practice in contraception, however, is undoubtedly to-day in urgent need of some entirely satisfactory means for women with prolapse or abnormal cervices, and also for the incorrigibly careless, who, while perhaps approaching to the state of feeble-mindedness, are not actually feeble-minded. In addition to the thousand personally instructed cases recorded at the clinic, we have been in touch in correspondence in the last year or two with something approaching 10,000 cases, which, so far as the less complete data about these women go, appear entirely confirmatory of the personal records obtained through the clinic. I am, Sir, yours faithfully,

MARIE C. STOPES.

61, Marlborough-road, Holloway, N.19.

*** Clinical experience ought to be recorded with the authority of the medical officer of the clinic.—ED. L.

? CAUSE OF DEATH.

To the Editor of THE LANCET.

SIR,—In reference to Dr. Henry Bird's letter in THE LANCET last week, from the position in which the body was found it seems possible that death resulted from a dislocation of the neck. Were the vertebræ examined p.m. ?

I am, Sir, yours faithfully,

Wylam-on-Tyne, August 5th, 1922. W. H. BISHOP.

THIRST AND RECTAL SALINES.

To the Editor of THE LANCET.

SIR,—It must be apparent to all fellow-students of Dr. Doreen Stranger (THE LANCET, August 5th, p. 304) that she has sacrificed hospital attendance for private research, for the administration of water instead of saline per rectum has been practised and vigorously taught in at least one clinic at Edinburgh Royal Infirmary for some years.

I am, Sir, yours faithfully,

EDMUND R. BOYD (H.S.).

County Hospital, Huntingdon, August 5th, 1922

THE HOT OPERATING THEATRE.

To the Editor of THE LANCET.

SIR,—I have for many years run my private operating theatre on the lines advocated by Mr. R. P. Rowlands in the last issue of THE LANCET, and can corroborate his conclusions in nearly every detail. An atmosphere which, owing to its excessive heat and moisture, reduces surgeons and nurses to the consistency of a boiled rag, cannot be other than harmful to a patient whose resisting powers have been reduced by disease or injury plus an anæsthetic. Even in recently constructed theatres it is quite common to find that steam from the sterilisers finds its way into the air of the theatre.

The principle of applying the heat where it is required—i.e., to the patient—instead of to all the contents of the theatre, has not yet met with general acceptance. A very moderate amount of external heating suffices for a patient who is placed on the table in fairly good general condition and whose vitality is not depressed during the operation by chill from exposure, severe loss of blood, trauma from rough operating, or over-anæsthetisation. For supplying the patient with heat the electrically-heated table is the best. In tables heated by cans or bags of hot water, the heat lessens as the operation proceeds, and is least at the end of the operation, the very time at which the patient requires it most.

For warming the theatre itself to a reasonable temperature, the old-fashioned radiator, still to be seen in recently built theatres, is far too much of a dust trap. The heating apparatus should be built into, and should form part of, the plane surface of the wall. Flat metal plates, electrically heated, answer admirably. Ventilation, in practice, resolves itself into either sucking the foul air out, its place being taken by air, more or less vitiated, from the rooms and corridors adjacent to the theatre, or diluting the foul air by driving in a continuous stream of out-door air, filtered, and if necessary warmed, the excess of air escaping from the theatre into parts of the building adjoining the theatre. The driving-in method is by far the better.

In July, 1914, the writer was in a newly built English theatre, which was being "ventilated" by an enormous extracting fan. The workers and the spectators found the atmosphere intolerable. Fortunately, the architect, in a moment of mental aberration, had fitted the theatre with an ordinary sash-frame window, which had to be opened to its fullest extent before the impending asphyxia could be obviated.—I am Sir, yours faithfully,

C. HAMILTON WHITEFORD.

Plymouth, August 5th, 1922.

THE MEDICAL DIRECTORY, 1923.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to every member of the medical profession. Most of the returns have already been received. If any practitioner has not yet sent us the latest information, we shall be glad to receive it by an early post.

We are, Sir, yours faithfully,

THE EDITORS.

7, Great Marlborough-street, London, W.1,
August 2nd, 1922.

NIGHT SWEATS

To the Editor of THE LANCET.

SIR,—The valuable communication on this subject by Dr. Marcus Paterson, in your isue of July 29th, calls for some comment, not because the statements therein are inaccurate, but because they give a wrong impression as to the frequency of night sweats in cases of pulmonary tuberculosis under proper hygienic conditions. Tuberculous patients very often give a history of profuse slumber-sweats; but in my experience such sweating is very rare under "sanatorium conditions."

When I was a visiting physician at the Mount Vernon Hospital for Diseases of the Chest, at Hampstead, about the time when the open-air wards were opened, I once asked the R.M.O. to look out some cases of night sweats, in order that I might study the circumstances with the consent of my colleagues; he could, however, only find three recent cases in the hospital, one of which had ceased to sweat at night, one had left the hospital a week before, and the third had just died. There were no cases amongst my own in-patients there. During the first 11 years of the existence of the Crooksbury Sanatorium, when I was directly responsible for the treatment, night sweats were equally rare. Out of 411 consecutive cases treated there between 1900 and 1911, only three had profuse night sweats after the first few days; and all three had extensive lesions and much constitutional disturbance. One of my colleagues there asked, on joining me, to have a supply of special pills for use in case of night sweats. There was, however, never any occasion to use a single one, and they remained untouched in the surgery. Both at Mount Vernon Hospital and at the Crooksbury Sanatorium at that time (1896–1911), the majority of cases admitted had extensive active lesions with fever; but with proper ventilation and good beds night sweats were decidedly rare.

Nine years' subsequent experience as tuberculosis officer, during which I have had several thousand cases under observation, has confirmed me in the opinion that patients with pulmonary tuberculosis do not usually sweat profusely unless they have too warm bedclothes, or the ventilation of their quarters is mismanaged. I agree with Dr. Paterson that night sweats are not peculiar to tuberculosis. I have met with instances amongst apparently healthy returned soldiers, and often failed to get even the history of night sweats from undoubtedly tuberculous persons; so that the symptom is not of much value in diagnosis.

Dr. Paterson's explanation of the mechanism of the symptom is probably correct; but his experience of its frequency at Colindale is singularly different from my own in Surrey. His communication rather suggests—probably unintentionally—that the use of a particular kind of mat is the best remedy for night sweats. I would, however, advise practitioners to be guided preferably by Dr. Paterson's own statements in "Shibboleths of Tuberculosis," and to regard night sweats as presumptive evidence of insufficient ventilation or other hygienic blunder.

I am, Sir, yours faithfully,

F. R. WALTERS,
Consulting Physician to the Crooksbury Sanatorium.

Pinecroft, Farnham, Surrey, August 1st, 1922.

Obituary.

ARTHUR JOHN HARRIES, M.D. BRUX., L.R.C.P. EDIN., M.R.C.S. ENG., L.S.A.

Dr. Arthur John Harries, who was formerly physician and lecturer on clinical dermatology to St. John's Hospital for Diseases of the Skin, Leicester-square, and physician to the Electrical Department at the Western Skin Hospital, died on July 28th in London at the age of 66. A student at University College, London, he qualified in 1880 by taking the L.R.C.P. Edin., the M.R.C.S. Eng., and the L.S.A., and was appointed honorary medical officer to the Holloway and North Islington Dispensary, thereafter devoting himself entirely to the study of dermatology and the application of electricity in medicine. In 1885 he edited and translated Warlomont's Animal Vaccination, and in an appendix to that work first suggested aseptic vaccination. In 1890 he published in THE LANCET an article on cataphoric medication and cocaine as a local anæsthetic, in which he described his procedure in a case of rachialgia where it was necessary to employ the galvano-cautery in the regions of the lower cervical and upper dorsal vertebræ. In this paper he says: "In the case under consideration a 10 per cent. solution of hydrochlorate of cocaine was used; a flannel-padded positive electrode, corresponding to the size and shape to the part to be anæsthetised, saturated with the solution; the larger negative electrode (soaked with salt and water) placed in a suitable position (front of thorax) and a continuous current of 25 milliampères passed steadily through the part (without reversals) for 40 minutes. As a result six consecutive applications of the galvano-cautère were painlessly made opposite the inter-vertebral spaces, each application extending two inches in length by one-eighth of an inch or more in depth." He was one of the pioneers of electro-therapeutics in England, and demonstrated at the Institution of Electrical Engineers the discomfort and fixation points for battery-produced alternating currents, making a similar demonstration for dynamo currents at the meeting of the British Association in 1890. He was the author of Lectures on Lupus, Electrolysis in Stricture, and a Manual on Electro-Therapeutics, besides making various contributions to the transactions of societies and to the medical press.

Dr. Harries, who was twice married, leaves five sons and one daughter.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Adjournment.

PARLIAMENT adjourned on Friday, August 4th, until Tuesday, Nov. 14th. The Royal Assent was given by commission to a number of Acts passed during the summer session, among which were the following: The National Health Insurance Bill; the Milk and Dairies (Amendment) Bill; the Criminal Law Amendment Bill; the Lunacy Bill; and the Local Government and Other Officers Superannuation Bill.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 2ND.

The Indian Medical Service.

On the motion for the second reading of the Consolidated Fund (Appropriation) Bill,

Sir W. JOYNSON-HICKS said that judging from the speech which the Prime Minister made on India a few months ago, it was not intended that the painter should be cut between this country and India. The magnificent work which this country had undertaken in India would be continued and developed until the Indians were ready and able to take over complete Home Rule, they would provide India with a Government and with a service of which India might well continue to be proud. The real difficulty was that the Indianisation of the services was proceeding at too great a pace, and if it went on to the extent which many Indian politicians desired—namely, to 100 per cent.—they might just as well say that they were no longer going to be responsible for India. Under an arrangement which had been made it was proposed that on the Indian Civil Service there should be a 48 per cent. Indianisation. That was to say, one-half of the Indian Civil Service would be Indians and only one-half British. At the present rate of progress that would be completed within nine years. In the case of the Indian Medical Service—perhaps the most important of all—the figures were very startling. Since 1915 there had been 174 appointments, and of these 101 had gone to Indians and only 73 to Europeans. The Indianisation of the Indian Medical Service was proceeding so rapidly that in many parts of India it was impossible for an English official or an English commercial man in the up-country districts to obtain the services of a white doctor. The I.M.S. was really the key service of the whole British service in India. They could not expect English officials in other services to settle down there for a period of years with their wives and the possibilities of families unless they put the clock back with regard to the Indianisation of the I.M.S.

Mr. LLOYD GEORGE (Prime Minister) said that the recent constitutional changes in India were in the nature of an experiment, but taking into account that the experiment had been in operation only a year and a half, he thought that there had been a very considerable measure of success. They must not pass a precipitate judgment on these experiments; on the other hand, he hoped that the Indian leaders would not force a precipitate judgment upon them by their action. A great deal of patience was required on both sides. One thing they must make clear—namely, that Britain would in no circumstances relinquish her responsibility in India. He felt sure that that would be a cardinal principle with any British Government that could command the confidence of the people of this country. Britain would take whatever steps were necessary to discharge or to enforce her responsibilities. They had invited the coöperation of the people of India in the discharge of their trust; but that was not in order to lead up to a final relinquishment of their trust, but with a view of bringing Indians into partnership in the discharge of that trust within the British Empire. He had looked up the statistics and he found that the total number of British civil servants in India was only 1200, governing 315,000,000 people. Those figures did not include the police and the Medical Service. There were 700 British police officers and 600 British medical officers. He did not believe that there was a country in the world that could produce such a triumph of government. There was no doubt that, because of the sense of disturbance and disquietude which recent events had created in India, difficulty had been experienced in obtaining recruits for the Indian Civil Service. He did not think that there was much in the difficulty as regarded medical men, or at least it was a different kind of difficulty. The difficulty in regard to medical men, a difficulty which was experienced even here—and they certainly could not get them in the Colonies—was due to the war. Young men were drafted into the army just at the time when they should have been undergoing their training, and the result was a great

gap which it would take some years to fill up. He (Mr. Lloyd George) was partly responsible in another way, because the Insurance Act had increased the demand for doctors, and what was supposed on the part of the medical profession to have been a great conspiracy, and was denounced as such, had turned out to be a real blessing and an encouragement to students to persevere in their studies. Naturally, the general shortage of doctors reflected itself in India.

Criticism of Pensions Administration.

There was considerable criticism of pensions administration upon the movement by Mr. LAWSON for the rejection of the Bill, but Sir E. POLLOCK (the Attorney-General) said that 90,000 cases had been dealt with by the tribunal, and it was quite impossible to go over the whole of the cases again. The motion for rejection was negatived by 110 votes to 30, and the Bill was read a second time.

Special Diet Allowances.

Mr. KENNEDY asked the Minister of Pensions the average number of disabled men who received special diet or allowance for this purpose during the three months ended March 31st, 1922; the number of such cases during the week ended July 22nd, 1922; and the percentage of such cases in which the disablement was certified as tuberculosis.—Major TRYON replied: I regret that figures for the precise periods referred to are not available, but during the three months March, April, and May, the average number in receipt of special diet allowances was about 6700, and in June it was about 42,000. Of the former figure 85 per cent., and of the latter 95 per cent., were cases of tuberculosis.

New Coroners' Legislation Promised.

Major BOYD-CARPENTER asked the Secretary of State for the Home Department whether it was the intention of the Government to introduce legislation dealing with matters affecting the position of coroners during the Autumn Session.—Sir J. BAIRD (Under Secretary to the Home Office) replied: It is hoped that it will be found possible to do so.

Morphia Made in England.

Viscountess ASTOR asked the Secretary of State for the Home Department what quantity of morphia was manufactured in England in 1920; how much of this was used for home consumption; and how the residue was disposed of.—Sir J. BAIRD replied: 643,985 oz. of morphine were made in 1920. No statistics of the amount used for home consumption are available. According to the returns supplied by the Customs, 322,464 oz. of morphine and heroin were exported, but these figures do not include postal exports or exports in the form of preparations.

Viscountess ASTOR asked the Secretary of State for the Home Department whether the output of morphia in this country was at present controlled under The Dangerous Drugs Act, 1920, by means of licences to manufacturers or by any other method; and, if not, why this course had not been adopted.—Sir J. BAIRD replied: Yes. The manufacture of morphine in this country can only be carried on under Home Office licence.

Medical Opium from India.

Viscountess ASTOR asked the Secretary of State for the Home Department whether 96,000 lb. of special medical opium were sent by the Indian Government to the Secretary of the Revenue and Statistics Department, London; and, if so, to whom, and for what purpose was it subsequently sold.—Sir J. BAIRD replied: I am not sure to what date the question refers, but it is the case that owing to the stoppage of supplies of Turkish and Persian opium, Indian opium was imported into this country during the war for the manufacture of morphia required for the British and Allied armies. It was sold to the manufacturers in this country. The balance of the stocks was reshipped to India early in 1920, and Indian opium is not at present being used by British morphia manufacturers.

Asylum Patients' Claim to Discharge.

Mr. ROBERT RICHARDSON asked the Minister of Health if he was aware that two ex-Service men—J. Wickenden at Long Grove and C. S. Norris at Banstead—were being detained in these two asylums respectively, while their parents in each instance were exceedingly desirous to undertake complete responsibility in regard to them and to give them comfortable homes and every care; that the wife of each, for reasons of their own, refused their release; that the wives' refusal was backed up by the medical official of the Pensions Ministry, who had decided that they must remain where they were and continue to be treated as lunatics on pain of loss of dependents' allowance; that the Board of Control had referred the case of these two private patients to the visiting committee, which had by the Act no power over the discharge of private patients; that the attempt to bar their discharge was inoperative, since the medical superintendent had failed to prove (in accordance with Section 74 of the Lunacy Act) that they were dangerous and unfit to be at large; that the delegation of powers of intervention to the Pensions Ministry was contrary to the provisions of the Lunacy Act; that, in the case of C. S. Norris, the decision of two independent doctors under Section 49 had been overridden by illegal reference of his case to a visiting committee, whose function was restricted to dealing with paupers; and, in view of the indignity thus perpetrated on ex-Service men, would he take steps to see that they were not any longer deprived of liberty, and that they were indemnified for the injury done them by a lump sum to enable them upon immediate discharge to find their way back to a self-supporting position in life.—Sir ALFRED MOND replied: I am fully acquainted with the facts of these two cases. The Ministry of Pensions are empowered to pay an allowance to the wives while the husbands are detained under institutional care. But if the patients are discharged contrary to medical advice, that allowance would cease. The visiting committee has power in regard to the discharge of all patients whether private or public by virtue of Section 77 of the Lunacy Act, 1890; there has been no occasion for the issue of a certificate under Section 74 of the Act, because no application for the discharge of the patients has been made by the person entitled to do so under Section 72 (2) of the Act. The recommendation of one of the doctors who examined the patient Norris under Section 49 of the Lunacy Act was that he should be given leave of absence on trial. This was properly referred to the visiting committee, in whom rests the power to permit such leave of absence under Section 55 of the Act. I cannot concur in the view that any indignity has been perpetrated on these ex-Service men, and the hon. Member is in error in regard to his interpretation of the legal points. I am satisfied that the patients are, at present, properly detained, but their cases will be kept under careful observation.

THURSDAY, AUGUST 3RD.

Medical Specialists and Pension Appeals.

Mr. MILLS asked the Minister of Pensions whether in appeal cases he would consider the utilisation of a specialist in each case rather than a general medical practitioner.—Sir E. POLLOCK (Attorney-General) replied: The regulations governing appeals to entitlement and assessment tribunals empower them in any case involving a difficult medical or surgical question to send the appellant to be examined by a specialist, who shall report to the tribunal, or to take the opinion of a specialist upon a case stated to him.

Disinfectant Sprays.

Sir WALTER DE FRECE asked the Minister of Health whether his attention had been called to the denunciation, at the recent meeting of the Royal Sanitary Institute at Bournemouth, of the spray form of disinfectant; whether this view was held by his sanitary advisers; and whether the views of his advisers were available for public guidance on this point.—Sir A. MOND replied: My attention has been called to press reports of the statement referred to. The opinion of my advisers on the point is expressed in the memorandum on prevention of influenza, issued by the Local Government Board in 1919, which states that the practice of spraying halls and other places of public resort with a disinfectant fluid is of doubtful utility and only tends to create a false sense of security.

The Indian Leper Act.

Earl WINTERTON, in reply to a question from Colonel Sir CHARLES YATE, explained that the amended Leper Act was not compulsory, though it was enforced throughout Bengal and in prescribed areas of Bombay and Burmah, while its application was being considered in other governments. 918 cases were reported, he said, to be in asylums in Bengal and 368 in Bombay. Treatment by chaulmoogra is employed in Bengal; in Bihar and Orissa intravenous injections of hydrocarpate of sodium and sodium morrhuate have been found satisfactory. It is stated by the government of Bombay that some of the patients have shown marked improvement under treatment, but none have been really cured, and recent research, he was informed, tended to implicate deficiency of certain essential constituents in diet.

Women Members of Asylum Committees.

Sir ROBERT NEWMAN asked the Lord Privy Seal whether, in view of the fact that there were over 30,000 women patients of unsound mind in borough and county mental hospitals which had no women members of the visiting committees of those asylums, the Government would consider the advisability of granting facilities during the Autumn Session for the passing of the Lunacy (Visiting Committees) Bill, or, that the Government would themselves undertake to pass a measure of their own having the same object in view.—Mr. CHAMBERLAIN replied: The Ministry of Health is preparing a Bill which will deal, amongst other things, with the subject referred to in the question.

FRIDAY, AUGUST 4TH.

Army Doctors and Pension Awards.

Mr. ALFRED T. DAVIES asked the Minister of Pensions whether army doctors only were now recognised by the Ministry in the examination of war pensioners; and whether there were any and, if so, what objections to the appointment of medical men not connected with the army to deal with these cases or to assist in dealing with them, considering the prejudice which had arisen against panels composed entirely of practitioners in the service of the army.—Mr. MACPHERSON replied: The answer to the first part of the question is in the negative. Subject to the overriding considerations of medical qualifications and experience—specialist or other—preference is given to medical practitioners who have seen service in the great war. I may add that by far the greater number of medical men in the employ of the Ministry have had no connexion with army service other than their temporary service in the late war.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on August 4th the following degrees in Medicine were conferred:—

B.M., B.Ch.—Duncan Gerard Leys, Balliol College; William Stephen Tunbridge, Lincoln College.

UNIVERSITY OF LONDON: *University College.*—Dr. J. C. Drummond has been appointed to the University chair of Biochemistry tenable at University College.

Mr. H. C. Dyson, of Epsom College, has been elected to the Epsom Scholarship which is tenable concurrently with the Carr Scholarship from Epsom College at University College, London.

Thomas Smythe Hughes Medical Research Fund.—Grants have been made for 1922-23 out of this Fund as follows:—To Charlotte Leighton Houlton, M.D., B.S., of the London (R.F.H.) School of Medicine for Women: £100 for an investigation of vaginal secretions, with a view to the discovery of some prophylactic method for the prevention of puerperal infection. To Vasant Ranji Khanolkar, M.B., B.S., B.Sc., of University College Hospital Medical School: £25 for an investigation of the presence of non-specific antibodies against proteins, with a view to further insight into the nature of non-specific immunity.

UNIVERSITY OF MANCHESTER.—The Ashby Memorial Research Scholarship in the Diseases of Children has been awarded to Miss Ruth E. Conway, M.B., Ch.B. Manc., M.R.C.P. Lond., who will undertake an investigation into the reaction of the blood and its relation to the bicarbonate content in cases of clinical acidosis—(1) in relation to anæsthesia, (2) in relation to diabetes in children.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination of the Conjoint Board, held from July 4th to August 1st, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—R. Anderton, Manchester; J. H. Andre, London; P. B. Atkinson, King's Coll.; D. N. Balter, St. George's; V. H. Barker and R. A. de C. Basto, London; J. Bernstein, Leeds; F. J. Biddle, Guy's; Nina Bohtlingk, Petrograd and Charing Cross; C. C. Bradsworth, Birmingham; B. Broman, Manchester; Violet W. Brown, St. Mary's; A. Cathcart, Liverpool; S. A. R. Chadwick, St. Thomas's; E. F. Chapman, St. Bart.'s; M. J. Cohen, Liverpool; Eleanor M. Creak, Univ. Coll.; G. C. W. Curson, Guy's; D. Davidson, King's Coll.; D. A. Davies, St. Thomas's; Mary L. Davies, St. Mary's; G. Denton, Leeds; W. Doorenbos, St. Bart.'s; A. M. Edwards, Charing Cross; W. Edwards, St. Bart.'s; A. Farid, Guy's; C. Fenwick, Durham; L. French, St. Thomas's; B. W. B. Gordon, St. Mary's; Winifred Marion Gray, Royal Free; Martha Griffith and J. Griffiths, Charing Cross; J. V. Hall, Liverpool; Tatiana Hardy, Moscow and Royal Free; H. A. H. Harris and H. W. Harvey, Guy's; E. Haworth, Univ. Coll.; Evelyn Nora Heather, Royal Free; Katharine M. Hick, Leeds; N. G. Hill, London; H. S. Hogg and W. D. Hoskins, St. Thomas's; W. E. Howell, St. Bart.'s; A. D. W. Jones, Westminster; R. Jones, Birmingham; C. L. Kark, Guy's; R. W. C. Kelly, St. Mary's; G. B. Kirkland, Guy's; G. Klionsky, St. Bart.'s; C. R. Lane, King's Coll.; Catherine E. L. Lendrum, Royal Free; J. L. Livingstone, King's Coll.; A. E. Lorenzen, St. Bart.'s; Mary Catherine Lynch, St. Mary's; H. J. Malkin, Univ. Coll.; Grace E. Mizen, Charing Cross; L. Morgenstern, Manchester; H. V. Morlock, St. Bart.'s; J. H. Piddock, Birmingham; Louisa M. Poynder, Royal Free; Margaret A. Quine, King's Coll.; A. B. Rao, Middlesex; T. P. Rees, St. Bart.'s; Dorothy W. Roughton, London; R. M. Saunders, King's Coll.; Lucy C. Simpson, St. Mary's; Agnes B. Smith, King's Coll.; M. Sourasky, Leeds; G. B. Taft, St. Bart.'s; T. R. Thomson, St. Thomas's; K. W. Todd, London; A. Walk, St. Bart.'s; Doreen G. C. Walker, Bristol; C. H. Walsh, Liverpool; W. R. Ward, St. Bart.'s; Agnes H. White, Royal Free; S. F. Wickramasinghe, Ceylon and Westminster; W. G. Wickremesinghe, Ceylon and London; Helen P. Wilkinson, Charing Cross; D. H. Williams, London; Caroline I. Wright, Charing Cross; and Marguerite A. Xavier, Royal Free.

Midwifery.—M. A. Afifi, Middlesex; H. S. Allen, Cambridge and St. Thomas's; J. H. Andre, London; G. R. M. Apsey, Guy's; Lucy Theodosia Badcock, London; J. M. Bailey, St. Thomas's; S. C. Bakhle, Guy's; D. Balter, St. George's; M. K. Barnett, Birmingham; Jessie H. Baxter, Univ. Coll.; A. E. Beith, St. Bart.'s; J. C. Bennett, London; Dora Mary Berry, Royal Free; M. Bersinski, Middlesex; Dorothy Bolton, Charing Cross; W. G. Booth, Guy's; B. Broadbent and E. B. Brooke, St. Bart.'s; Georgie G. Brown, Charing Cross; Mary G. Brown, London; Viola C. Cameron, St. Mary's; H. G. R. Canning and C. O. Carson, Guy's; R. H. Carter, London; S. A. R. Chadwick, St. Thomas's; Phyllis M. S. Chalmers, Royal Free; J. Chronnell, Manchester; F. M. Collins, King's Coll.; Annie E. Connan, Royal Free; G. K. Cooper, St. Thomas's; W. F. Cooper, St. Mary's; R. L. Corlett, Liverpool; Gladys M. Cox, Royal Free; J. E. D. Crozier, St. Thomas's; D. Davidson, King's Coll.; V. D. J. de Boissiere, Guy's; Gertrude M. de Souza, Madras and Royal Free; D. Diamond, St. Bart.'s; W. N. Douglas, Durham; G. P. Driver, St. Bart.'s; A. D. Dyson, St. Thomas's; W. Edwards, Cambridge and St. Bart.'s; M. N. Eldin, St. Bart.'s; Lucy M. Elsom, King's Coll.; R. H. Enoch, St. Bart.'s; G. M. Evans, St. Thomas's; Gwladys Evans, St. Mary's; H. Evans, Guy's; R. V. Facey, St. Thomas's; C. Fenwick, Durham; C. W. S. Fernando, Univ. Coll.; G. E. Fisher, Guy's; H. H. Fisher, St. Bart.'s; Constance C. Fleck, Royal Free; Annie Foner, Univ. Coll.; R. R. Foote, St. Bart.'s; L. Forman, Guy's; C. J. Fox, St. Mary's; C. A. H. Franklin, St. Thomas's; Emily L. Franklin, King's Coll.; Joan O. Geldard, Univ. Coll.; L. Ghabriel, King's Coll.; C. P. R. Gibson, St. Thomas's; S. Glass, Birmingham; S. J. Golden, London; Winifred M. Gray, Royal Free; Mercy Greenish, St. Mary's; J. Griffiths, Charing Cross; Marion L. Grimmer, Westminster; P. Hack, Guy's; J. V. Hall, Liverpool; H. A. H. Harris, Guy's; N. G. Harris, St. Thomas's; A. W. Hart-Perry, St. Bart.'s; P. G. Harvey, Guy's; F. J. Hector, Bristol; Katharine M. Hick, Leeds; H. S. Hogg, St. Thomas's; Nancy W. Holloway, Univ. Coll.; R. J. Hooker, Guy's; Madge W. Hubble, King's Coll.; Gwynedd Hugh-Jones, Royal Free; J. G. Hume, St. George's; D. M. Hutchinson, Sheffield; H. Jackson, Middlesex; M. B. Jay, St. Bart.'s; A. L. P. Jeffery, St. Thomas's; G. Klionsky, St. Bart.'s; C. P. Ledward, Univ. Coll.; Catherine E. L. Lendrum, Royal Free; L. B. Liebster, London; Marian Lones, Univ. Coll.; Greta Lowe, Manchester; C. R. McClure, London; Phyllis C. Mackenzie, Westminster; Kate Madders, Univ. Coll.; Elizabeth Maitland-Jones, London; R. Manners, Durham; M. Markiles, Guy's; Dorothy E. Mason, Royal Free; L. Mather, Manchester; H. C. Meathrel, Guy's; Grace E. Mizen, Charing Cross; H. V. Morlock, St. Bart.'s; Ethel W. Morris, Royal Free; E. B. Murrell, St. Thomas's; A. Nathan, Charing Cross; Nancy B. Ockenden, Univ. Coll.; Mary E. Ormsby, Royal Free; E. Orsmond, Guy's; J. N. J. Pacheco, London; Beryl Palmer-Jones, King's Coll.; A. F. Percy, Guy's; Ethel B. Poole, Westminster; T. H. I. Potts, Sheffield; Eleanor M. Pulleine, Royal Free; Margaret A. Quine, King's Coll.; V. J. Rao, London; Dorothy M. Rees, King's Coll.; R. P. Rees, Middlesex; Phyllis M. Rex, St. Mary's; H. S. Rich, Middlesex; D. Riding, Liverpool; J. W. Rigby, Sheffield; R. Riley, St. Mary's; J. A. L. Roberts, Bristol; B. W. Roffey, St. Mary's; A. B. Rufail, Cairo and King's Coll.; Edna M. Sanders, King's Coll.; D. H. Sarafian, Middlesex; Margaret V. Saul, King's Coll.; V. Scheu, Zurich and Geneva; A. T. Schofield, St. Mary's; P. G. Sedgwick, Guy's; H. L. Shepherd, Bristol; Mary M. Sillito and Helen O. Skelton, Royal Free; A. W. L. Smith, Manchester; R. S. S. Smith, St. Bart.'s; S. Snelson, Manchester; A. C. Sommerville, King's Coll.; Muriel A. Stephens, King's Coll.; M. Stieber, Westminster; S. S. Suzman, Guy's; R. W. Taylor and T. B. Thomas, St. Bart.'s; Doris Todd and Olga F. Tregelles, St. Mary's; W. R. van Langenberg, Middlesex; A. Walk, St. Bart.'s; Doreen G. C. Walker, Bristol; E. G. L. Walker, St. Thomas's; Hilda M. Weber and Joan F. Whitelock, Univ. Coll.; D. B. Whitlock, Guy's; S. F. Wickramasinghe, Ceylon and Westminster; A. K. Wiggins, Middlesex; E. L. Williams, London; E. Williams, St. Thomas's; J. L. Woodhouse, Guy's; Caroline I. Wright, Charing Cross; and M. I. Zimmerman, Westminster.

Surgery.—W. F. T. Adams, St. Bart.'s; I. J. Bechal, Guy's; L. J. Bendit, Univ. Coll.; W. R. Bennette, Liverpool; J. Bernstein, Leeds; E. B. Brooke, St. Bart.'s; M. J. Cohen, Liverpool; H. E. C. Collins, Sheffield; A. L. Crockford, Cambridge and St. Thomas's; V. R. J. de Boissiere, Guy's; M. Denman, Middlesex; E. S. Etheridge, Univ. Coll.; R. H. Evans, London; C. P. R. Gibson, St. Thomas's; S. Glass, Birmingham; W. G. R. Hore, Guy's; F. Hudson, Univ. Coll.; K. E. A. Hughes, St. Thomas's; M. B. Jay, St. Bart.'s; S. W. Jeger and J. Jensen, London; A. D. W. Jones, Westminster; R. Keene, St. Bart.'s; J. P. Kies, St. Thomas's; Emilia B. M. Krause, B. J. Leggett and L. B. Liebster, London; E. Liston, St. Bart.'s; V. M. Matthews, St. Mary's; H. C. Meathrel, Guy's; E. B. Messinier, Middlesex; S. Mobaruk, London; B. S. Nat, St. Andrews; M. K. G. Pillai and P. R. Rashbrook, London; D. Riding, Liverpool; J. W. Rigby, Sheffield; B. W. Roffey, St. Mary's; I. I. A. Shaheed, St. George's; D. G. Sharp, Guy's; A. G. Silver, Middlesex; A. G. Story,

Cambridge and St. Thomas's; M. A. Townshend, Univ. Coll.; E. Williams, St. Thomas's; H. W. M. Williams, St. Bart.'s; and Harriette B. Woodhouse, Royal Free.

INTERNATIONAL EXCHANGE OF HEALTH OFFICERS.—The Medical Director of the Health Organisation of the League of Nations has recommended that certain Governments should be invited to commission some four or five of their medical officers of health to work for a period of three months within the ranks of another health administration. The Health Committee have agreed to the Governments being approached in regard to this matter, as they felt it to be desirable that all possible facilities should be granted to health officials to familiarise themselves with sanitary science and the organisation of public health in countries other than their own.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: NEW GROUP.—The Association of Medical Officers of Fever Hospitals has decided to accept the invitation of the Society of Medical Officers of Health and to join that Society as the group of Medical Officers of Fever Hospitals. At a meeting of the new group held on July 31st at the offices of the Society, Dr. E. W. Goodall was elected President and Dr. A. F. Cameron hon. secretary of the group. Candidates for election as members of the group should send their names to the hon. secretary as soon as possible in order that they may be included in the list of members for the coming year now being prepared.

THE LATE DR. C. M. MACQUIBBAN.—The death took place at Aberdeen on July 30th of Dr. Charles Mitchell MacQuibban, the oldest medical practitioner in the city and one of the best known citizens, in his eighty-ninth year. Dr. MacQuibban was born in Oldmachar in 1834. He graduated M.B. at Aberdeen University in 1861, and M.D. in 1883; later he took the diploma of L.R.C.S. Edin. Dr. MacQuibban's practice lay largely in the east end of Aberdeen, where he had a surgery and consulting room. He had a very large circle of friends, and was a familiar figure in the city, continuing in active practice until a few weeks before his death. He was an enthusiastic Volunteer. In 1861 he became attached to the 7th Volunteer Battery of the Aberdeen Artillery, and later was gazetted assistant surgeon in the Royal Aberdeenshire Highlanders, becoming in 1876 surgeon major and in 1888 lieutenant-colonel.

Appointments.

CHURCHILL, STELLA, L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Assistant Medical Officer to the St. Pancras Borough Council.

LUKER, S. G., M.D., B.Ch. Camb., M.R.C.P. Lond., F.R.C.S. Edin., Gynæcologist to the Hampstead General and North-West London Hospital, Haverstock Hill, N.W.

POOLE, BESSIE H., L.D.S. Manc., B.Sc. Lond., Dental Surgeon to the Rhondda Urban District Council.

ROBERTSON, W. H., Certifying Surgeon under the Factory and Workshop Acts for Burton-in-Kendal.

ROBINSON, A. L., L.M.S.S.A., Assistant Medical Officer, National Sanatorium, Benenden.

St. Thomas's Hospital: GAYDON, F. A., M.R.C.S., L.R.C.P. Lond.; BAIN, C. W. C., M.B., B.Ch. Oxf.; LEYS, D. G., M.B., B.Ch. Oxf.; OLIVER, C. P., M.R.C.S., L.R.C.P. Lond.; MACPHERSON, N. S., M.R.C.S., L.R.C.P. Lond.; PATRICK, C. V., M.R.C.S., L.R.C.P. Lond.; NICHOL, R. W., M.R.C.S., L.R.C.P. Lond.; CHURCHER, J. C., M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists. HARVEY, S. E., M.R.C.S., L.R.C.P. Lond.; BURNS, C. L. C., M.R.C.S., L.R.C.P. Lond.; BHANDARI, P. C., M.R.C.S., L.R.C.P. Lond.; DREW, J. G., M.R.C.S., L.R.C.P. Lond., Resident House Physicians. MCCLEAN, D., M.B., B.S. Lond., Resident House Physician (for Children). WILLIAMS, B. W., M.B., B.Ch. Oxf.; HACKWOOD, J. F., M.B., B.S. Lond.; CHAVASSE, C. C. H., M.B., B.Ch. Oxf.; SMALLEY, L., M.R.C.S., L.R.C.P. Lond., Resident House Surgeons. COLE, L. B., M.R.C.S., L.R.C.P. Lond., Resident Orthopædic House Surgeon. GOUGH, J. H., M.R.C.S., L.R.C.P. Lond.; NEILSON, D. F. A., F.R.C.S. Eng., Resident House Surgeons for Ear, Nose and Throat. GRANGER, E. D., M.B., B.S. Lond., Senior Obstetric House Physician. PHILLIPS, F. A., M.B., B.Ch. Camb., Junior Obstetric House Physician. HUMFREY, S. H. G., M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon. CURRIE, J. G., M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon. CAVENAGH, J. B., M.A., M.B., B.Ch. Oxf.; HEAP, E. C., M.R.C.S., L.R.C.P. Lond.; SUDBURY, F. B., M.R.C.S., L.R.C.P. Lond.; FULLER, C. B. S., M.R.C.S., L.R.C.P. Lond.; SHIRES, B., M.B., Ch.B. Edin., Clinical Assistants.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—Res. S.O. £250.

Belgrave Hospital for Children, Clapham-road, S.W.—H.S. £100.

Birkenhead County Borough.—Asst. M.O. £650.

Cardiff, King Edward VII. Welsh National Memorial Association.—Asst. M.O. £800.

City of London Maternity Hospital, City-road, E.C.—Res. M.O. £100.

Dreadnought Hospital, Greenwich.—H.P. £150.

Dudley, Guest Hospital.—Hon. Surg.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Haverhill Urban District Council, &c.—M.O.H. £700.

Hertford County Sanatorium.—Med. Supt. £500.

Huddersfield County Borough.—Asst. M.O.H. £500.

Hull Royal Infirmary.—Asst. H.S. £150.

Kesteven County Asylum, Sleaford, Lincs.—Med. Supt. £800.

Leicester City Education Committee.—Asst. Sch. M.O. £500.

Leicester, City Mental Hospital, Humberstone.—Asst. M.O. £600.

Liverpool Royal Southern Hospital.—Two H.P.'S and three H.S.'s. Each £100. Res. Cas. O. £150. Also Pathologist.

London Homœopathic Hospital, Great Ormond-street, W.C.—Res. M.O. £100.

London Temperance Hospital, Hampstead-road, N.W.—H.S. £200. Cas. O. £150.

Manchester, Barnes Convalescent Hospital, Cheadle.—R.M.O. £300.

Manchester Royal Infirmary.—Asst. Director of Clin. Laby. £350.

Manchester, Victoria Memorial Jewish Hospital.—Res. M.O. £150.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Med. Reg.

Newcastle-upon-Tyne, University of Durham College of Medicine.—Sen. Demonstrator of Anatomy. £600 to £700.

Northumberland Mental Hospital, Morpeth.—Asst. M.O. £400.

Norwich, Norfolk and Norwich Hospital.—H.S. £150.

Rotherham Hospital.—Jun. H.S. £150.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.

Ventnor, Isle of Wight, Royal National Hospital for Consumption, &c.—Asst. Res. M.O. £300.

Virginia Water, Surrey, Holloway Sanatorium.—Jun. Asst. M.O. £400.

Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £700.

West Bromwich County Borough.—First and Second Asst. M.O.H., &c. £700 and £500 respectively.

West London Hospital for Nervous Diseases, Regent's-park, N.W.—H.P. £100.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Ribchester.

Births, Marriages, and Deaths.

BIRTHS.

BOSTOCK.—On August 2nd, the wife of Colonel J. S. Bostock, R.A.M.C., of a son.

GURNEY-DIXON.—On July 31st, at Ober House, Brockenhurst, Hants, the wife of S. Gurney-Dixon, M.A., M.D. Cantab., of a daughter.

MACKIE.—On August 3rd, at Thornyhill, Burley-in-Wharfedale, Yorkshire, the wife of George Mackie, D.S.O., T.D., M.D., of a son.

MARRIAGES.

BROWN—BROWN.—On August 2nd, at the Parish Church, Selsey, Sussex, William Herbert Brown, M.D., to Jessie Lilian, second daughter of the late David Brown, Belford-place, Edinburgh, and of Mrs. Brown, The Martins, Selsey.

CAMPBELL—LONG.—On July 29th, at Radlett, Herts, Colin McArthur Campbell, L.D.S. Edin., to Gertrude Louise Long, younger daughter of the late Charles Long, Esq., of Watford.

HALL—HALL.—On August 1st, at St. Peter's Church, Aldwincle, G. A. M. Hall, M.B., to Joan Frances, younger daughter of the late Rev. H. O. Hall, Vicar of Bude.

PECK—TUBBY.—On August 2nd, at St. Margaret's, Westminster, Eric Finch Peck, M.R.C.S. Eng., L.R.C.P. Lond. (late Lieut. R.F.A.), to Marie Hilda, only child of Lieut.-Col. A. H. Tubby, C.B., C.M.G., M.S., and Mrs. Tubby, Harley-street, W.

ROSE—SKIDMORE.—On the 2nd inst., at Smethwick Old Church, B. Theodore Rose, B.Sc., M.B., Ch.M., F.R.C.S. (Edin. & Eng.) to Dora R. Skidmore, only daughter of the late W. H. and Mrs. Skidmore, of Birmingham.

DEATHS.

EDGE.—On July 27th, at his residence, 46, Rawlinson-road, Southport, Abraham Matthewson Edge, M.D., M.R.C.P., late of Manchester, aged 71.

HART.—On July 22nd, at Exeter Lodge, Exeter-road, Bournemouth, Richard Neville Hart, M.D., M.A., M.R.C.S., L.R.C.P., aged 43 years.

KEYS-WELLS.—On July 30th, Ernest Nevile Keys-Wells, M.B., C.M., Capt., R.A.M.C. (T).

MACQUIBBAN.—On July 30th, at Union-street, Aberdeen, Lieut.-Colonel C. M. MacQuibban, M.D., 3rd Battalion Gordon Highlanders, late Medical Officer in charge of 75th Regimental District.

POWELL.—On August 2nd, at the Manchester Royal Infirmary, Winston Elias Powell, M.B., Ch.B., aged 24, younger son of David and Mary Powell, The Croft, High Lane, Stockport.

WATKINS.—On July 31st, at Wykeham House, Romsey, John Prestwood Watkins, M.R.C.S., L.R.C.P., aged 58 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE HISTORY OF THE STUDY OF ANATOMY: A RETROSPECT.*

BY HERBERT C. JONAS, M.D., B.S. LOND.

THE study of the history of anatomy may neither help us to become one whit more proficient, or skilful in our profession, nor advance scientific knowledge, but it does teach us toleration and humility. This paper endeavours to give a short account of the various modes of thought, and of the notable discoveries, which paved the way for Harvey's demonstration of the circulation of the blood. You will see how near some thinkers came to the truth, by what narrow margins they missed achievement, and how errors, quite incomprehensible to us, persisted for ages; but chiefly you will note the hopelessly blighting effect of a reverence for authority.

Renouard, the great medical historian, has divided up the age of the foundation of medicine into four periods: 1. The primitive, to 1184 B.C., that is about the end of the Trojan war. 2. The mystic, to about 500 B.C., corresponding to the dispersion of the Pythagorean society. 3. The philosophic, ending with the foundation of the Alexandrian Library. 4. The anatomic, ending with the death of Galen about 200 A.D. Until 500 B.C., the approximate end of the mystic or sacerdotal period—that is to say, until man began to think things out for himself, refusing any longer to be spoon-fed by the priests—anatomy was nothing but wild conjecture.

Egypt.

Primitive man we may entirely ignore in this inquiry; we may turn at once to the civilisation of Egypt. At Sakkarah is the grave of Sek-het-en-ankh, the earliest known physician, dated about 3000 B.C.; and judging by the tomb he was a man of note in his day, but of his medical science we have no record. It is necessary to go forward another thousand years, to the Ebers papyrus, before we obtain any information concerning Egyptian medicine. This document is held to be a compilation from much earlier works; it was written about the year 1550 B.C.—a little before the time of the Exodus—and contains the following most interesting passage: "If the physician places his fingers on the head, arms, feet, or body everywhere he will feel the heart for its vessels go to all parts." So that more than 1500 years before Christ the natural phenomenon of the pulse had been observed, and its connexion with the heart correctly noted; but it took the profession over 3000 years to find the scientific explanation of the ascertained facts. Anatomical knowledge, however, was poor on the whole; and an explanation of this fact may, perhaps, be found in the procedure of the embalming ceremonies. One man's sole duty was to make the necessary first incision; as soon as this was done the others, after giving him a fair start, set to work to stone him. The anthropologists hold that this is sure evidence of the old view of the infectivity of the corpse; under such disadvantages, it is not surprising that the practical study of anatomy languished.

An exhortation to medical students, found in an old papyrus, seems to show that human nature varies very little; to clinch the matter, pictorial representations of student carouses have been discovered. The exhortation runs thus: "Thou forsakest thy books, thou givest thyself up to pleasures, goest from tavern to tavern, the smell of beer maketh men to shun thee." It really could not have been better done by the Dean of a medical school 20 to 25 years ago. But if we are to believe the statements of students of to-day, the progress of the last 20 years has been greater than that of the preceding 5000.

Semitic Civilisations.

The contemporary civilisations need not long detain us. Assyrian medicine was nothing but demonology; the Assyrians enacted that on the Sabbath day the art of the physician should not be practised. The enlightened Jewish race definitely allowed dissection in the Talmud; they were the first to recognise those peculiarities of the os sacrum which later earned for that bone its present name. In the Hebrew it is called *luz;* to the Arabs it was later known as *aldabaran*—a name used in the Middle Ages for the purposes of charms and incantations. That *luz* may be identified with the os sacrum appears from a reported conversation between Hadrian and Joshua Ben Hananiah. Hadrian asks, "How doth a man revive again in the world to come?" and gets the answer, "From Luz in the backbone." Hananiah then proceeds to show that water cannot harm, fire burn, mills grind, or hammer and anvil crush it.

China and India.

Anatomy was unknown in ancient China. In later years the Chinese adopted Western diagrams, sometimes copying them most inaccurately. For instance, the trachea was sent straight to the heart, and from there three tubes went off to the liver, the spleen, and the right kidney, and from this last to the brain. What these tubes conveyed was a profound mystery. The pulse was very much recognised; in fact, to feel the innumerable pulses took the conscientious Chinese doctor more than an hour. A sort of motion is described of the blood and air and vital spirits contained in these many canals, but there appears no kind of intelligent meaning in the vague Chinese system of medicine.

Hindu anatomy consisted in an apparently meaningless subdivision of the body; for example, there were 17,000 vessels each composed of 7 tubes giving passage to 10 gases. A pulse was recognised, having its origin in a reservoir behind the umbilicus. However, this civilisation produced two men of note—Charaka and Susruta—the latter of whom held a flattering view of the handicraft of surgery, which he described as "the first and the highest division of the healing art, least liable to fallacy, pure in itself, perpetual in its applicability, the worthy produce of heaven, the sure source of fame on earth." These are comfortable words for the surgeon; but of the general practitioner he says: "He who only knows one branch of his art is like a bird with one wing."

Greece.

It required the more intellectual civilisation of the Greeks to produce a proper appreciation of the higher merits of the physician. When Asklepios bestowed the power of healing on his two sons, the greater gift and the elder son's portion was not the light hand and manual dexterity of the surgeon, but "The great precision of mind, so as to understand what cannot be seen, and to heal seemingly incurable diseases." Although the first Greek physicians, the Asklepiadæ, were obviously close and patient clinical observers, they do not seem to have been seriously concerned with the study of anatomy. Dissection was still not permitted, even in 460 B.C., at the time of Hippocrates, whose ignorance of anatomy is startling when contrasted with his clinical acumen. Arteries and veins were confounded; nerves, tendons, ligaments, and membranes were not differentiated. There is scarcely a mention of the pulse throughout the Hippocratic writings—a fact which seems to indicate that Greek medicine owed little to Egypt. Moreover, the Alexandrian physicians, after the Greek conquest of Egypt, seem to have been little if at all influenced by the medical knowledge of the older culture. Hippocrates, however, unlike some of his successors, did not give rein to his invention, but followed his own maxim, "Nothing should be affirmed until by our senses we have become aware of it." This was exactly the attitude of mind of St. Thomas when he said, "Except I put my fingers into the print of the nails, I will not believe." St. Thomas should therefore have become the patron saint of science—instead of which the Church has made of his name a byword of unbelief.

Praxagoras of Cos, one of the immediate followers of Hippocrates, added both facts and fictions to the sum of knowledge. He traced the veins to the heart, differentiated the arteries from the veins, and decided that the former contained air, naming them in the light of this original misconception. We have perpetuated the memory of this mistake to the present day. There are many such misnomers—for instance, gonorrhœa, meaning "a running of the semen." A description of the treatment advocated by Praxagoras for intestinal obstruction has survived; after the failure of purgatives, enemata, emetics, and rectal injections of air, he advised massage of the abdomen, and finally laparotomy, removal of the obstruction, and suture of the intestine. There is, however, some doubt whether or no he practised what he preached.

Aristotle cannot be claimed as a member of our profession, but his overpowering intellect was bound to exercise some influence on every sphere of knowledge. His study of comparative anatomy led him to do some human dissection, and he described the brain pretty accurately, although he did not recognise its proper function. He stated that the nerves proceed from the heart, and he calls the aorta "a nervous vein." He was tutor to Alexander the Great, founder of the Alexandrian medical school; and he is said to have been the grandfather of Erisistratus. The Alexandrian school marked a most important advance in medicine. Under the Ptolemies anatomy was systematically taught therein from the fourth century B.C. Dissection was encouraged, and the demonstrations were patronised by royalty. The period in which this liberal attitude was adopted was of

* A paper read before the Devon and Exeter Medico-Chirurgical Society.

short duration, ending with the Roman domination of Egypt; the Romans were too near barbarism to have lost the idea held by all primitive peoples, that to touch a corpse was an unclean act. Herophilus and Erisistratus were two of the Alexandrian anatomists; the former left his name on the occipital bone, and the latter was the first to describe the valves of the heart. This work was fairly accurate; he traced both arteries and veins to that organ, and just missed a fundamental truth, for he found that arteries sometimes contained blood, but—having to square the discovered fact with accepted doctrine—he held that normally they contained air and that inflammation was the result of blood getting into them.

To recapitulate—the Greek knowledge of the circulation was very rudimentary. A difference was recognised between vein and artery, but the trachea was also thought to be an artery; arterial bleeding was known to be more serious than from a vein, and it was realised that there was pulsation in the arteries, and not in the veins; but no explanation of these phenomena was offered.

Galen.

In the second century A.D. a great medical man arose in the person of Claudius Galen. He became far greater than his actual deserts, however, for he lived in Rome during the golden age of the Antonines, and came in point of time so near to the barbarian invasions that for a thousand years after his death the whole of Europe—a Europe trained by the rapidly advancing Christian church to slavish and unreasoning worship of dogma and authority—never ventured to appeal, in matters medical, to anything but the word of Galen. Thus his dead hand blighted all medical advancement until the Renaissance; but Galen did try to learn his facts at first hand. He dissected many animals, including monkeys, and disproved by experiment the theory that arteries contain air, but he made these three false statements, all unsupported by experimental evidence (1) That veins originate in the liver; (2) that the important action of the heart is its diastole; and (3) that the interventricular septum is permeable. These three errors, being accepted as axiomatic, delayed progress for centuries. Since Galen held so long the position of medical dictator, it is necessary to give a brief summary of his views. He taught that food is absorbed from the alimentary canal, carried by the portal vein to the liver, and there converted into blood and imbued with what he called "natural spirits." This crude blood is then carried by the vena cava to the right side of the heart, from whence it *percolates through invisible holes in the septum* into the left ventricle. No notice is taken of the cardiac valves, or of the auricles. As the heart *expands* it draws air from the lungs into the left ventricle by means of the pulmonary vein, and in this cavity the blood is mixed with air and becomes imbued with "vital spirits," which enable it to carry out its vitalising functions throughout the body. The heart is the seat of original animal heat placed there in the beginning by the Almighty, and the constant indrawing of cool air tends to keep this innate heat from becoming too excessive. The motion of the blood is conceived of as a tide-like ebb and flow along both arteries and veins. Galen thought that the blood in the pulmonary artery underwent the same ebb and flow for the nourishment of the lung, and apparently seems to have held that there was an excretion of vapours into the pulmonary passages. Thus he made some very shrewd guesses, unfortunately marred by the imperfection of his anatomy; but his account of the portal circulation is substantially accurate.

Nemesius.

Nemesius, Bishop of Emissa, who lived at the end of the fourth century A.D., has been claimed by some to have anticipated Harvey's discovery. He says: "The motion of the pulse takes its rise from the heart and chiefly from the left ventricle of it; the artery is with great vehemence dilated and contracted by a sort of constant harmony and order. While it is dilated it draws the thinner part of the blood from the next veins, the exhalation or vapour of which blood is made the aliment of the vital spirit. But while it is contracted, it exhales whatever fumes it has through the whole body, and by secret passages so that the heart throws out whatever is fuliginous through the mouth and nose by expiration." This is said to be the only passage in the writing of Nemesius which bears on the subject of the circulation of the blood—an extremely slender foundation on which to base so great a claim.

The Arabs.

After the Mahommedans had overrun a large part of the Eastern and some of the Western world, the Caliphs saved from the wreck as much Greek and Roman learning as they could find in the wake of the barbarian invasion; thus when the Western nations awoke again to the value of art and science, they were obliged to turn to Arabic translations of the original Greek and Latin works. The Arabs were essentially compilers and copyists, and showed little originality, except in enlarging the materia medica. Dissection was viewed with horror, and no anatomical discoveries can be claimed by the Arabs. We may omit the mediæval times and the great school of Salernum and turn at once to the sixteenth-century anatomists.

Andreas Vesalius and his Pupils.

Vesalius was the first man to realise that anatomy had to be learnt by dissection. He was born at Brussels; from a gibbet outside Louvain he obtained his first skeleton, which he smuggled in pieces into the city. At Paris he studied osteology in the burial-grounds, and was driven from his work by savage dogs. The enlightened city of Padua elected him to the chair of anatomy at the age of 25. Vesalius confined himself in his criticism of Galen to the correcting of misstatements of matters of fact, feeling sure that any correction of theories would sooner or later bring him into conflict with the Church.

The teaching of Vesalius quickly bore fruit; immediately after him came Columbus, who followed him in the professorship, and Servetus; one of these two discovered the pulmonary circulation. Columbus has generally been given the credit of the work, but Sir Michael Foster has gone thoroughly into the evidence, and concludes that he was a plagiarist without conscience. However that may be, one of them definitely disproved Galen's statement that the septum was permeable. Columbus says, "The vein-like artery was made to carry blood mixed with air *from the lungs to the left ventricle.*" But he also maintains that veins carry blood to all parts of the body. Servetus wrote the "Restitutio," in which he says, "We must first learn the generation in substance of the vital spirit itself, which is composed and nourished out of the inspired air." He then describes the difference between arterial and venous blood as we know it, and states that "communication does not, however, as is generally believed, take place through the septum of the heart, but by a signal artifice the subtle blood is driven by a long passage through the lungs." Calvin burned this man at the stake with a thousand copies of his book, in Geneva, in 1553.

Cisalpinus and Fabricius.

Cisalpinus, perhaps writing more for the theologians than for the medical profession, and most probably more for the love of controversy than for the advancement of knowledge, seems nevertheless to have gone a step further than his predecessors; he grasped the pulmonary circulation and seems to have had some dim visions of the systemic circulation, in that he appreciated that blood flowed to the tissues through the arteries, and returned through the veins; he made no attempt at scientific reasoning, and his contemporaries ignored his views entirely.

Fabricius, another Paduan professor, described quite accurately the valves in the veins, but was obsessed with Galenic doctrine, and completely missed the importance of the discovery, likening the valves to the dams in a stream—of course the very opposite of their real function. Among the pupils of Fabricius was William Harvey who in 1602 returned to England, and in 1628 published his "Exercitatio." The great virtue of Harvey's work was the way in which he boldly, and in quite a short treatise set forth in regular sequence all the facts concerned, and demonstrated every proposition before proceeding to the next. His was the first great harvest to be reaped from the new methods originated by Vesalius, and it had the effect of making all things possible to further research.

REPORT OF THE JOINT COMMITTEE ON THE PHYSICAL EDUCATION OF GIRLS.

AT the instance of the College of Preceptors a committee was formed in October, 1921, to consider the effects of physical education on girls, under the chairmanship of Dr. G. F. Still. Representatives were appointed by the following bodies:—Royal College of Physicians of London, Royal College of Surgeons of England, British Medical Association, Medical Women's Federation, British Association for Physical Training, Ling Association, National Union of Women Teachers, Association of Assistant Mistresses in Secondary Schools, Private Schools Association (Incorporated), College of Preceptors. The Head Mistresses Association did not accept the invitation to send representatives.

Scope of Inquiry.

The Committee formulated a number of inquiries which were submitted in the form of a questionnaire to persons who might be expected to have special knowledge of the subject. These included medical practitioners, headmistresses, and women students, medical and otherwise. A report of an investigation by the Ling Association was also before the Committee. Altogether 629 replies were received, and of these 233 were from medical practitioners and 158 from women medical students; 185 replies came from head-

mistresses, 96 being from State-aided schools, and the others from independent schools.

It was thought advisable to send a special questionnaire to medical practitioners in order to obtain information on the medical aspects of the subject. The information so obtained was submitted to a special committee consisting of the medical members, and the section of this report dealing with this aspect of the subject was formulated by them.

Considered Opinion of Schoolmistresses.

Amongst the schoolmistresses there was a general consensus of opinion that the effects of games and physical exercise on the disposition and character of girls are beneficial; but a small number thought there was a tendency to magnify the relative importance of games to the detriment of character. The important question whether gymnastics with apparatus is suitable for girls was specially inquired into, and it was found that although about 66 per cent. of the schoolmistresses were in favour of such gymnastics, about half of those who approved were of opinion that there was special need for careful supervision if apparatus was used. Amongst women students, medical or otherwise, 80 per cent. were in favour of the use of apparatus. Very few harmful results were attributed to it; some, especially among the women students, thought that such gymnastics conduced to muscular strength and development without gracefulness. Gymnastics without apparatus was approved alike by mistresses and by students, medical or otherwise, though a few considered such training as less valuable than gymnastics with apparatus. The need for fully qualified gymnastic teachers was emphasised.

As to particular games, lawn tennis and netball received very general approval. Hockey, though approved by the majority of mistresses and students, was regarded by some as suitable only for the older and stronger girls, and by some as too rough or strenuous a game for girls. Several objected to it as inducing faulty positions. Cricket was very generally approved, but some doubted its utility as a game for girls. Very little serious objection, however, was raised to it, some of the disapproval was based on the ground that it entailed too much standing and might thus induce faulty carriage. Lacrosse was approved by almost all who offered any information about it. Football met with less approval than any other game; of 52 schoolmistresses who expressed their views on this game, only two were in favour of it, and among women students though a few approved, many more objected to it on physical or other grounds; in general, it was regarded as entailing too much strain.

With regard to other sports, swimming was generally approved, but many schoolmistresses and students emphasised the need for moderation and supervision. It was recognised particularly that harm may be done by remaining too long in the water, and that swimming is an exercise entailing some strain on the heart, so that it is not suitable for all girls. The danger of heart strain was emphasised even more in regard to rowing, which, though approved by the majority of those who gave information on the subject, was thought by some to be too strenuous an exercise for girls in general. Racing in rowing was condemned by 27 out of 34 women medical students, and ill-effects were recorded. Cycling, provided it is in moderation and that the cycle is properly adjusted to the individual, met with a large measure of approval, but by some it was thought to cause round shoulders, and some schoolmistresses pointed out that when girls have to cycle too long a distance to school the strain makes them unfit for mental work.

Contests in games and sports were thought by many to require careful limitation and grading with the view of preventing overstrain. It was recognised that the games and sports already mentioned by no means exhaust the physical training which is available for girls. The value of dancing was generally emphasised, eurhythmics were approved by some, whilst others were in favour of horse-riding, fencing, golf, badminton, or fives.

There was very general agreement that ill-effects would be less likely to occur from the more strenuous forms of physical education if previous medical examination were more general. It was also suggested that the risk of ill-effects could be reduced if a short time was devoted to games or sports daily rather than a longer time once or twice weekly. It is a mistake for girls to be subjected to strenuous physical exercises after hours of mental strain. Ample time should be allowed for rest after games and sports before recommencing mental work. It is very desirable, also, that facilities should be given for changing underwear after strenuous games. A wise and sympathetic tact is an essential factor in adequate supervision by the games mistress.

It is difficult to summarise the opinions held as to the general, physical, and mental effects of games and sports upon girls. By many it was thought that, apart from physical fitness, they conduce to alertness, resourcefulness, and judgment, and encourage a public-spirited and healthy outlook. On the other hand, there is a minority of those who think that games and sports tend to foster a love of pleasure, detrimental to home and other interests, and to lessen womanly qualities.

Report of Medical Members of the Committee.

The opinion of the medical members of the Committee, after due consideration of the information before them, was as follo vs :—

That suitable physical education, including games and sports, is as generally beneficial to girls as to boys. There is, however, need for discrimination; individual girls may be unfit for particular forms of exercise, and on this account medical examination as to fitness is generally desirable.

Amongst the particular games which the Committee had under consideration—viz., tennis, netball, lacrosse, golf, hockey, cricket, and football, only the last is considered unsuitable for girls. Of sports, swimming, rowing, cycling, horse-riding, are all good for girls provided that they are carried out under suitable conditions and excess is avoided. Competitive games and sports are equally permissible provided that they are undertaken with due regard to the fitness of the individual. Any game or sport may become unsuitable if practised in such a way or to such degree as to cause undue strain or fatigue. There is also a balance between mental exertion and physical fatigue which cannot be altogether ignored. A girl who is working at high pressure for examinations may have to play games less strenuously. On the other hand, fatigue by physical exercise is a bad preparation for mental work.

With regard to gymnastics, whether with or without apparatus, there is no doubt of the value of disciplined exercises under expert direction in promoting the harmonious development of the muscles and preventing faulty position and carriage. The use of apparatus entails special care as injurious effects may come from injudicious exercise of this sort.

An important question in connexion with the physical education of girls is whether and to what degree there should be restriction of physical exercise during the menstrual period. Abstention from games and sports has been very generally recommended hitherto, but in recent years evidence has been brought forward to show that these restrictions are harmful rather than beneficial. The medical members of the Joint Committee are not prepared at the present time to state any final judgment on the question, but consider that the evidence they have justifies more extensive trial of the *voluntary* continuance of games, sports, and gymnastics (swimming excepted) during the menstrual period. The disturbance of functions so often observed during school life occur also in girls who do not take part in athletic pursuits, and the influence of physical exercise on these disturbances is quite open to doubt. The production of any internal displacement is probably very rare.

Perhaps the most important point which arises in connexion with the physical education of girls is its influence in after life, if any, upon motherhood. It is difficult to obtain conclusive evidence on this point. It might be thought that the increased muscular and bone development consequent on much physical exercise might increase the difficulties of parturition, and, whether for this reason or not, labour has been thought by some to be lengthened in such cases. On the other hand, the increased muscular power might serve to facilitate parturition, and some observers have attributed a good result in this way to strenuous physical education.

On the whole it would seem that there is no clear proof that strenuous physical education has any special influence either upon the prospect of motherhood or upon the difficulty of labour.

The conclusions reached by the Joint Committee may seem less precise and positive than might be expected, but the Committee felt that the evidence available was not such as to justify dogmatic statement on many of the points under consideration. Nevertheless they hope the investigation may not have been without value if it draws attention to the important problems of the physical education of girls and particularly if it serves to stimulate further research, and to encourage the collection of what is much needed—namely, well-attested facts and observations.

COMPULSORY CREMATION.

WITH reference to recent remarks in our own columns on the subject of cremation Mr. H. Charles Batchelor has sent us a copy of the *Guy's Hospital Gazette* for Dec. 1st, 1894, in which he had set out the then arguments for making cremation compulsory. The practice has become so much commoner during the past 20 years that it is interesting to recall that Mr. Batchelor devoted space to discussing the actual legality of burning a body after death.

"In 1882," he wrote, "the matter came before a court of law, Mr. Justice Kay being the judge. The deceased had directed a friend of his (who was not one of his executors)

to burn his body under a pile of wood, and also ordered his executors to pay his friend the expenses of such cremation. The friend brought an action against the executors and others, claiming repayment of the cremation expenses (the cremation having been effected at Milan), and Mr. Justice Kay decided that the case could not be sustained, one of the reasons being that there can be no property in the dead body of a human being.

"In the year 1884 the exact question of the legality of cremation came before the late Mr. Justice Stephen, who stated that he had the concurrence of another of the judges Lord Justice Fry. A Dr. Price was charged at the Cardiff Assizes with having attempted to burn his child's body. He had placed the corpse in a ten-gallon cask of petroleum and set the petroleum on fire. A crowd collected, and the burning body of the child was covered with earth, and the flames extinguished. The charge of Mr. Justice Stephen to the Grand Jury on this occasion is full of interesting and learned information upon the subject of burial, but without going further into detail, the following passage of his conclusion as to the English law of the disposal of dead bodies may be quoted:

"'After full consideration, I am of opinion that a person who burns instead of burying a dead body does not commit a criminal act unless he does it in such a manner as to amount to a public nuisance at common law'; and . . . 'As for the public interest in the matter, burning, on the one hand, effectively prevents the bodies of the dead from poisoning the living; on the other hand, it might, no doubt, *destroy the evidences of crime*. These, however, are matters for the legislature, and not for me.' It thus appears that there is nothing in English law to render cremation illegal, that the practice is now carried on, and although the system of registering deaths and granting certificates remains unaltered, cremation is authorised in England as a legal method of disposing of the dead."

COLONIAL HEALTH REPORTS.

Barbados.

THE estimated population on Dec. 31st, 1920, was 198,336. The birth-rate for the year was 29·68 per 1000, and the death-rate 26·44; the infantile mortality was 270 per 1000 births. Public health throughout 1920 was generally good except for the prevalence of typhoid fever in four districts. 165 cases of this disease were treated in the General Hospital in Bridgetown, and the deaths were 55. The Government pipe-borne water throughout the island continued to be reported on as chemically and bacteriologically pure, and the increasing prevalence of typhoid fever was held to be the result of direct infection from person to person by contact and of indirect infection by flies. Barbados (writes the Colonial Secretary, Mr. Francis Jenkins, in his annual report), is the healthiest of all the West Indian Islands, and is much patronised by residents in neighbouring colonies as a health resort. The anopheles mosquito, the carrier of malaria, is not found in the island. This is a somewhat curious fact, since it is scarcely conceivable that some are not imported in the inter-colonial sailing craft which crowd the "Careenage," or inner basin of the harbour, but the insects do not appear to find suitable breeding places on shore. The temperature throughout the year varies, as a rule, from 74° to 84° F. The hot and rainy season lasts from the beginning of June to the beginning of November. The island gets the full benefit of the North-East trade-winds, and between November and May the night temperature sometimes falls as low as 64° F. The winter months are regarded as the tourist season. The year 1920–21 was one of extreme drought.

East Africa Protectorate.

The estimated population on Dec. 31st, 1919, was 2,719,664, all natives with the exception of 16,706 Indians, 9567 Arabs, 2393 Goans, 5914 Europeans, and 237 of other races. Of the Europeans, 2742 were British, including 671 Government officials, 1188 farmers and planters, 833 commercial men, 110 missionaries, and 91 professional men. On the whole the year 1919 was more favourable to the health of all classes than 1918, when famine and pestilence wrought much havoc. In the various hospitals and dispensaries 122,901 cases were treated with 1253 deaths. Amongst officials, European and non-European, the daily average on the sick list declined, but the number of invalidings and deaths of European officials increased, contributory causes being the ravages on health due to military service and the heavy strain occasioned by overwork on account of the service being understaffed. Malaria was the principal cause of admission to hospital. An outbreak of plague occurred in the Kisumu area in May, 1919, and up to the end of the year 182 cases, of which 159 were fatal, were noted in the Lake Province. A few cases occurred also at Nairobi and Mombasa. The total number of prophylactic inoculations was 31,046, as compared with 37,430 in 1918. Small-pox appeared sporadically in all parts of the Protectorate, 543 cases with 168 deaths being reported; 263,829 vaccinations were performed. The vaccination ordinance is now operative in practically the whole of the country. Native vaccinators are trained at the Health Office and then detailed for duty wherever their services may be required. Though the influenza pandemic practically ended in 1918, localised outbreaks occurred in 1919, but, generally speaking, the type was not severe; the number of cases reported was 2278, with 111 deaths. As in previous years, the prevalence of dysentery calls for comment. Dysentery of bacillary origin is responsible for by far the larger number of cases, but since the cessation of hostilities it has been steadily declining. There has been a marked diminution in the incidence of cerebro-spinal fever since the pandemic of 1913. Seventy-seven cases of enteric with 17 deaths were recognised during the year; of these, 35 cases with 7 deaths occurred in Nairobi. Voluntary inoculation against enteric is not popular in the colony; only 22 persons submitted themselves for it during the year. 4900 samples of mosquitoes were brought into the Health Office for identification; the percentage of anopheles in relation to the total number of samples was 2·25.

Zanzibar.

The last Census showed that the population of Zanzibar and Pemba was 196,733, but it is now generally presumed to be considerably in excess of that figure. With the exception of a slight epidemic of influenza of a mild type the Protectorate was free from epidemic during 1920. Among the native and Indian population there were 41 deaths from tuberculosis, 16 from malaria, 9 from dysentery, and one each from small-pox and cerebro-spinal fever, these statistics showing no appreciable difference from those of the previous year. In 1920 the rainfall was considerably below the average, only 44 inches being recorded in Zanzibar, 47 inches at Mkokotoni (in the north of the island), and 69 inches at Pemba. The average mean temperature was, for Zanzibar, maximum, 84·1° F., minimum, 77°, and for Pemba, maximum, 85·8°, minimum 77°. The climatic conditions in Zanzibar, although exceedingly trying in the hot season, which lasts from November to March, are not necessarily unfavourable to Europeans, provided that periods of residence do not exceed two years without change to a cold climate.

LLANDRINDOD WELLS MEDICAL GOLF CUP.

A COMPETITION restricted to qualified medical practitioners will take place under handicap on Sept. 20th, 21st, and 22nd, for a Challenge Cup (value 50 guineas). The first prize will be a £10 10*s.* replica of cup, and a second prize, value £5 5*s.*, will also be given. The entrance fee will be 5*s.*, and no green fee will be charged to competitors whose handicap is limited to 18. Entries (received up to first post on Sept. 19th) should be sent to Secretary, Golf Club, Llandrindod Wells, from whom all particulars may be obtained.

THE measles epidemic continues at Manchester, and 988 new cases were notified, with 23 deaths, during the week ending July 29th. The highest number in any week prior to the present epidemic was 691 cases in March, 1920.

INDEX TO "THE LANCET," VOL. I., 1922.

THE Index and Title-page to Vol. I., 1922, which was completed with the issue of June 24th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

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